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ABSTRACT

This quantitative study describes the system infrastructure needs and perceptions of the 28 Florida community colleges regarding current Web course delivery. Section 1 assesses 27 (96.4%) Florida Community College Distance Learning Consortium (FCCDLC) member representative responses to a 19-item, researcher-designed survey. The study includes assessment of interview responses from five selected FCCDLC member representatives. Section 2 reviews literature and information in order to provide a historical perspective, views of technology in education, distance learning, infrastructure reliability and scalability, and institutional readiness factors for online course delivery. Methodology was planned in question design and sequencing. The study's 19 areas of inquiry address the following larger issues: (1) What incentives and rewards are there to motivate faculty in obtaining knowledge to develop and teach online classes? (2) What academic services and technical support are available to students enrolled in online classes? (3) What processes, procedures, instructional design, and technical support are available for faculty who develop online courses? (4) What software, equipment, and facilities are being used for the development and delivery of online courses? and (5) What levels and degrees of online courses exist in relation to the size of the institution? Findings indicate that 66.6% of Florida community colleges offer incentives or rewards, and 81.4% of colleges support faculty in development of Web courses. (Contains 79 references.) (Author/NB)

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SYSTEM INFRASTRUCTURE NEEDS for WEB COURSE DELIVERY: A SURVEY of ONLINE COURSES in FLORIDA COMMUNITY COLLEGES

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A dissertation submitted in partial fulfillment of the requirements
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in the Department of Educational Research, Technology, and Leadership
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ABSTRACT

This study described the system infrastructure needs and perceptions of the 28 Florida community colleges regarding current Web course delivery. Section one assessed 27 Florida Community College Distance Learning Consortium member representative (96.4% of the population) responses to a nineteen item, researcher-designed survey. The study included assessment of interview responses from five selected FCCDLC member representatives.

Section two reviews literature and information in providing a historical perspective, views of technology in education, distance education, distance learning, infrastructure reliability and scalability, and institutional readiness factors for online course delivery.

Survey items covered perceptions within the educational institutions on priorities of Web course development, incentives and support for faculty, levels and involvement of faculty and technical support personnel, institutional processes, procedures, and budgeting for Web course development and implementation, instructional design, and online student support. Five distance learning consortium members were interviewed using researcher-designed structured but open-ended questions related to general survey items.

Results of the study suggested that Florida community colleges are providing incentives for faculty in helping to motivate and support them in developing and teaching

online courses. Academic services and technical support for students varies among the community colleges but there is interest and concern for online learner support both academically and technically. Support processes, procedures, instructional design, and technical support initiatives found in this study suggest positive campus climates for cultural acceptance and institutional readiness of Web courses in Florida community colleges. A wide range of software, equipment, and institutional facilities were identified for use in the development and delivery of online courses with some dominant commonalities established in software. All of the 27 survey participants indicated some online course initiative at their colleges with the level and degrees of involvement varying widely based upon many different factors.

Recommendations for future study included research on other community college systems, types of personnel experience and education needed for supporting and administering online courses, faculty, support staff, and administrative attitudes toward Web courses and distance learning and education, student success level comparisons with live face-to-face instruction, differences in online course pedagogy, and full college services provided for fully online students.

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CHAPTER 1

INTRODUCTION

Web course instructional delivery is a relatively new approach to distance education that creates independent opportunities for seeking knowledge. The expansion of technology has the potential for major changes in the future of education. Several factors have combined in recent years to form this new educational delivery system based on the use of technology. Those factors include; the continued development and affordability of personal computers with increased quality of performance and processing capabilities; the availability of recently invented fiber-optic cabling to transfer massive electronic information signaling over a unified network address system – the Internet; rapid Internet expansion through out global communities; and the development of huge stores of Internet accessible information available on demand.

Educators have utilized computers in various ways over the past few decades but more recent access to the Internet system has raised the interest levels for Web course instruction. Key factors that make Web course instructional delivery attractive to educators are: first, the continued expansion of the Internet; and second, the increased capability and speed of personal computers to process information and access remote Web sites and resources.

The personal computer has revolutionized the way people work, learn, and play (Shao & Brandt, 1989). The affordable price of computers and the integration of the

Internet have opened opportunities for educators to offer Web course instruction for student access. These events have combined to change the way courses are delivered and the computer has changed the way we educate. For successful Web course delivery it is important to have a comprehensive and supportive system infrastructure. As Sullivan (2001, p. 13) states, "Community colleges that expect to play a leadership role in a Web-based learning environment should develop an organizational strategy that maximizes distributed learning capabilities and that engages faculty in the transition ...by supporting training, instructional design, and classroom research." A comprehensive and supportive infrastructure involves technology, students, faculty, staff, and the overall culture of the institution.

Basic computer technology must be in place to accommodate faculty needs for Web course development at their office, campus facilities, or home. Basic factors include; the processing speed of the computer; appropriate software; sufficient hard drive space; and the use of a zip drive among other peripheral items. Institutionally there must be an adequate and reliable file server capable of processing faculty, student, and course interaction needs for online delivery of instruction. A technology work staff can be very beneficial in assisting and supporting faculty online course computer needs. According to Oblinger and Maruyama (1996, p. 8), "Faculty are content experts but, when using technology, often feel compelled to become experts in instructional design, application design, and technical implementation. Technology makes many faculty anxious." The support of faculty would include course software education, in addition to technologic

support for hardware and software, instructional design for online courses, and visual design of content pages for online courses.

To design online courses it is important to have infrastructure support for effective Web instructional strategies. Farrington and Bronack (2001, p. 76) note, "We must remember that online education is still very much in the novelty stage. Most who are using technology to teach and learn are still relying heavily on the use of technology within the context of existing methods." Faculty members are subject-matter experts regarding the necessary content for online courses but it is extremely important to have software, hardware, technology, and a visual design system infrastructure in place to provide comprehensive support. The instructor must shift from the role of content provider to content facilitator, gain comfort and proficiency in using the Web as the primary teacher-student link, and learn to teach effectively without the visual control provided by direct eye contact (Williams & Peters, 1997). While there are some technological and economic restrictions involved with online course development, it is available to those willing to commit to the challenge.

Background and Significance of the Study

Technology-based course delivery systems are changing the way some faculty design instruction for education. Although the direct costs involved for hardware and software for educators to design online courses has dropped, some questions remain

regarding how faculty and students are supported and what implications are involved with online course development and delivery.

The development and implementation of a Web-based system infrastructure for instructional design serves as a cornerstone for educational institutions to move toward effective online course offerings and delivery. Traditional course formats may limit the potential of applying the theoretical components of Web-based instruction to a variety of student learning scenarios. According to Murray Goldberg, founder of Web CT, "The real power of the Web for the educational setting lies in expanded opportunities for communication, community building, and collaboration" (Gooldale, 2001, p. 7). It would therefore seem important to reconsider instructional material presented for online class use and to provide forums for discussion and application.

Moore (1993) suggests that there are three types of interaction necessary for successful distance education: 1) learner-content interaction, 2) learner-instructor interaction, and 3) learner-learner interaction. Distance learning instructors need to ensure that all three forms of interaction are maximized in their course structure. Some goals to be considered for online course development and delivery could include:

1. To increase the interactivity, communication and collaboration among students.
2. To provide access to timely resources of information.
3. To provide a means to extend class discussions beyond scheduled meeting times.

4. To make communications accessible between the teacher and students.

Course Web pages offer a means of maintaining contact between students and teachers outside of class through a class listserv, the use of an electronic whiteboard, and through CU-See-Me technology. Links to additional resources and information can be updated and posted in a very timely manner. Additionally, individuals located around the world can serve as resources. Hyper textbook links provide a wide variety of graphic and text information to support and augment class discussions. Web course materials can be accessed and reviewed nearly anytime before or after classes and used as points of discussion.

Using the Internet effectively for teaching and learning can require a substantial investment in curriculum development and infrastructure services. The investment should provide comprehensive institutional resources for main areas of online course operations to ensure that colleges do not risk the development and support of online courses in a continual support crisis mode.

Many faculty members have never taught online, and therefore wonder what they are getting themselves into (Smith, Ferguson, & Caris, 2001). Faculty members may depend on essential support services such as media specialists, instructional systems developers, computing consultants, and equipment technicians to assist them in gaining access to and effectively using instructional technology. In developing a central service for Internet based teaching and learning, an established system infrastructure can help to prevent an "institutional support crisis." Online teaching and learning can be a difficult

process if faculty and students are continuously distracted or hampered by problems of how to make technology work. Although many teachers believe computers are an important component of a student's education, their lack of knowledge and experience lead to a lack of confidence in attempting to introduce them into their teaching. This lack of confidence then leads to anxiety and reluctance to use technology (Pelton & Pelton, 1998).

Research by Berge and Muilenburg (2001) indicates a lack of organizational change and technical expertise as barriers to distance education. Those factors support the need for cross-divisional cooperation and global campus technology strategies to minimize the risk of various support problems. A knowledgeable, highly competent, academically oriented, and user-friendly support staff should be the primary help resource for students to solve technical problems, in addition to being the primary educational support and facilitation group for faculty and online course delivery.

Statement of the Problem

Florida community colleges are involved in the development and delivery of online courses but there are a variety of processes and procedures for how these courses are implemented from design to actual online delivery. There is no comprehensive assessment of the system infrastructures for Web course delivery in Florida's community colleges. In actual practice there would be a need to know the present status of online courses among Florida community colleges in helping to develop and set standards for

those colleges already involved in or just beginning to enter this technologic academic arena.

The distance education paradigm shift from traditional teaching methods poses important questions for the study and knowledge of how Florida community colleges have overcome barriers in providing supportive system infrastructures for faculty and students involved with online instruction. A broad base of information for online course development and delivery would assist colleges in knowing what support system infrastructure models are being implemented to surmount barriers for the design and delivery of online courses. Moore (1994), as a result of extensive distance education research, speculated that:

> ...the barriers impeding the development of distance education are not technological, nor even pedagogical. We have plenty of technology, and we have a fair knowledge of how to use it. The major problems are associated with the organizational change, change of faculty roles, and change in administrative structures. Here we desperately need all the ideas and all the leadership that can be assembled. The starting point is to expose the problems. (p.4)

Although Florida community colleges are dominantly focused on offering traditional classroom instruction, there should be recognition of the need for, and value of, providing faculty and student's essential access and support for online courses. Will community colleges be players in this new world of learning? At this point, the question seems to be not whether they will be players, but in what way and how soon

(Sullivan, 2001). The questions of this study relate to gaining understanding of both procedural and readiness factors involving college priorities, learners, faculty, and levels of online course development as follow:

1. What incentives and rewards are there to motivate faculty in obtaining knowledge to develop and teach online courses?
2. What academic services and technical support are available to students enrolled in online courses?
3. What processes, procedures, instructional design, and technical support are there for faculty to develop and teach an online course?
4. What software, equipment, and facilities are being used for the development and delivery of online courses?
5. What levels and degrees of online course development exist in Florida community colleges in relation to the size of the institutions?

Methodology

As education through the use of Internet expands, it may become even more important for community colleges to develop and offer online course instruction to remain accessible, competitive, and prominent in current educational culture. This qualitative study provided a status report of how, and to what extent, online courses are being developed, implemented, and supported in Florida community colleges. The results provided an understanding of the system infrastructure methods and rationale

for the inclusion of online course curriculum that may adequately serve community college students presently and in the future.

A survey instrument (Appendix B) was developed and reviewed for validity by Institutional Research personnel at Lake Sumter Community College and the University of Central Florida. The survey was then distributed by mail to designated Florida Community College Distance Learning Consortium members employed in positions of academic deans, vice presidents, presidents, campus provosts, department chairs, or instructional designers at the 28 Florida community colleges to ascertain information as follows:

1. Is Web course development and support a priority at the college?
2. In what quantity do online courses exist at the institution and for what length of time have online courses been a part of the college curriculum?
3. In what academic areas are online courses being developed and taught?
4. What personnel, departments, and processes are involved in supporting the development and delivery of online courses?
5. What types and levels of online learner support are available?
6. What incentives are there to encourage faculty involvement in developing and teaching online courses?
7. What budgetary support has been implemented for developing, supporting, and delivery online courses?

A follow-up cover letter (Appendix D) was composed for possible use in another mailing to first-time non-respondents. To achieve more immediate results, the follow up cover letter was emailed to first time non-respondents with an attachment of the original survey document. Telephone contacts were also made to some of the distance learning consortium member population to give personal follow-up reminders and appeals for help in completing and returning the survey by email, fax, or postal service. Analysis of completed and returned surveys was then conducted

A second method of investigation was conducted through five personal interviews with selected distance learning administrators or support staff personnel who had direct experience with campus cultural attitudes toward, and access to online course development, equipment, and instruction. The main intent of this research phase was to supplement the short, direct nature of the mailed survey questions with an expanded investigation of more open-ended and in-depth responses and information obtained. A sample of the follow-up interview instrument is included in Appendix F. Interview selections were based on recommendations by distance learning consortium members regarding perceived online course leadership development of various colleges, and the size of the institutions with consideration for the need of established processes and procedures to institute online courses. These criteria of the interviews helped provide a larger perspective of the possibilities for online course development and delivery among the other Florida community colleges. The interview survey results were analyzed to

further examine and determine the present status of online course instruction in Florida community colleges.

The mailed research and interview instruments were developed and reviewed for validity with help from the departments of Institutional Research, and interactive distributed learning staff at both the University of Central Florida and Lake Sumter Community College. All interactive research involved developing stringent informed consent protocols for submission to and obtaining final approval of the University of Central Florida Institutional Review Board. Information submitted for this process included the name of researcher, title of the study, purpose of the investigation, research methodology, potential benefits and risks to the participants, guarantees of confidentiality and anonymity, and procedures for questions and concerns that may arise during the course of the investigation. A state limited liability statement was also required and is included in Appendix C.

Research was conducted based on procedures for survey design and interview methodology learned through independent efforts, techniques of the Institutional Research Office of Lake Sumter Community College, and coursework at the University of Central Florida in EDF 7463: Analysis of Survey, Record, and Other Qualitative Data; EDF 7403: Quantitative Methods in Educational Research; and EDG: 7939 the Doctoral Seminar.

The intent of this research project was to collect and analyze data that provided support for addressing perceived and identified needs of community college faculty and

students regarding online course accessibility. The literature review section includes a comprehensive description of online course development infrastructures identified as related factors affecting future directions of online education.

Assumptions of the Study

Assumptions of this study included accurate responses to survey items, and that Florida community colleges are involved with the development and delivery of online courses. For the institutionalization of online teaching and learning to occur there is a need to integrate planning and implementation of online courses into existing or new college processes and procedures. Some colleges may have organizational processes, knowledgeable support staff, adequate overall computer equipment, and support of faculty commitments that facilitate interests to implement online teaching and learning. Those favorable conditions contribute to the concept of institutional readiness making it possible to initiate online teaching and learning support at an educational institution (Truman-Davis, Futch, Thompson, Yonekura, 2000).

Another assumption was that some colleges might lack an established, comprehensive, and unified system infrastructure, or the ability to change in meeting demands for developing and delivering online courses and programs. Lastly, some colleges may not have faculty development initiatives or faculty and learner support systems to conduct online course initiatives.

Limitations of the Study

Limitations for this study were:

1. This study was limited to the 28 Florida community colleges comprising the public two-year college system. Similar results may not match other educational institution environments based on geographic locations, program offerings, academic climate, organizational culture, and technologic capabilities. Differences in organizational structures may also impact responses about system infrastructure needs. While the response rate is adequate for the comprehensive data review and analysis, generalizations beyond the scope of this study are limited.
2. This study involved strictly voluntary participation by respondents and interviewees. Based on participant constraints of convenient and available time, the amount of effort used in responding to questions may have varied. This researcher worked to coordinate time for interruption-free response telephone interviews, but the mailed survey instruments were beyond those controls. Telephone interviews provided a valuable method and source for data collection. Ideal research, free of cost and time restraints, would include on-site visitations as a preferred interview method whenever and wherever possible.
3. The mail survey resulted in 26 completed and returned responses of 28 sent. A tentative listing of the Florida Community College Distance Learning Consortium members was used for tracking and identifying the present key

distance learning personnel for survey distribution. There were several changes of personnel, titles, phone numbers, area codes, and mail addresses that had to be researched for obtaining the most recent and correct contact information.

4. The time frame of the study was limited to the 2001 – 2002 academic year. Responses of survey participants may have been impacted by question interpretation and terminology, institutional organization, personnel job titles, and overall variability of established system infrastructures at this particular time frame. Lack of present day standardization in the development of this relatively new instructional delivery system may have resulted in the use of terminology that is not yet fully clarified, established, and incorporated in the present language of online instruction. Terminology may be used differently among the participating individuals and institutions. Although present-day, accurate word choices were thought to be used on surveys, the technology and delivery systems continue to develop at such a rapid rate that some of the terminology in this study may be out dated just in the course of time it takes to accomplish this research.

Terminology

In an educational context, curriculum development and infrastructure services define two main functions in providing online course delivery. Curriculum development encompasses the work of faculty divisions, departments, programs and personnel in creating the academic content for course subject areas and conducting the teaching

processes. The Library, Teaching and Learning Center, Information Technology Services, Registrar and many other various non-teaching cost centers, could be involved with providing infrastructure services and support.

Infrastructure services could also be defined by customary practice; by the organizational location of facilities, skills and knowledge; and by the perceptions of individual staff. In some educational settings it may be customary to expect computer staff to fix most any kind of computer malfunction, regardless of the origin or nature of a problem. It may also be customary for students to seek computing assistance and support from any helpful source, regardless of a college's formal support services structure.

The facilities, and the personnel with skills and knowledge for computer support are also located in teaching divisions or departments. Perhaps the most notable instructional areas are those academic programs with specific computing needs, or well developed, forward planning for technologic access and support. Individual faculty may have widely varying expectations about the nature and extent of support services they may rely upon, and the extent to which they as instructors are providers of computer technical support services to their online students.

The definition of infrastructure services according to who is the provider may not be a clear specification. It would be important to integrate infrastructure services as seamlessly as possible with existing teaching, learning, and administrative processes working together on and off campus at a college.

Curriculum development and delivery support are central core requirements for providing documentation, consultation, and staff development opportunities regarding instructional designing for online delivery. Faculty need to be knowledgeable in how to link reference and resource material from the Internet and how to structure tutorial functions for online modules or units. System infrastructure should ensure that faculty are educated and adequately prepared for online teaching and are able to effectively design instruction for online courses. It is necessary to provide production services, and online course delivery support, such as Web page authoring, graphics, and reliable and adequate server environments to facilitate, supplement, or complement the work of faculty and instructional designers. System infrastructure must also provide and create channels for electronic submission of assignments, virtual library reference lists, and other online course needs.

Help desks and server environments can play an important role when viewed as tools to help concentrate on concerns of faculty and student support. Francis and Evans (1995) point out that attitudes and expertise are major factors in adoption and successful use of computer technologies. The help desk and user support may be consulted for handling a broad range of online course problems. The server environment tool is critical because there are demands for quick correspondence, evaluation, and possible implementation of a variety of software for conducting Web based course preparation and delivery activities. Areas of student support, course module delivery and curriculum development, and delivery support are critical for instructional and institutional success.

A college-wide commitment is important to flexible delivery principles for online courses. System infrastructure needs to be a reliable, responsive, and economical pathway for student user training, documentation, and staff development to facilitate the educational online course goals of teachers and learners.

Today's educational paradigm focuses on the student as termed the learner, and the teacher as mentor or coach. Education previously centered on the teaching factor but now emphasizes the learning factor. Once passive learners in teaching classrooms are now expected to be active distance learners in the educational process.

Definition of Terms

Asynchronous Learning. Can occur in different time frames and at irregular intervals, and interaction is delayed over time and accessed at the learner's convenience.

Bandwidth. Determines the rate at which information can be transmitted across a medium. The rates are measured in bits (bps), kilobits (kbps), megabits (mbps), or gigabits per second (gbps). Transmission services are 56 kbps, 64 kbps, 1.544 mbps (T1 line), and 45 mbps (T3 line).

Chat Room. An online area within Web networks where users can simultaneously communicate through text typed into computers with a software browser.

Digital. A process of binary representation of an electronic signal, which allows analog audio, and video signals to be converted into computer language.

Distance Education. The formal process of planned distance learning with instructional delivery of a variety of modes including electronic technology that do not require the learner to be simultaneously in the same physical location as the instructor or informational resource.

Distance Learning. Either synchronous or asynchronous learning where the instructor and students are in physically separate locations and various electronic communications are used.

Distributed Learning. Distance and campus-based learning that utilizes information technology for instructor and student communication.

E-Learning. A process utilizing computers with Internet and intranets for learning.

Gateway. A computer system that transfers data between normally dissimilar networks or incompatible applications. It reformats data for communication so that it is acceptable to both networks and applications.

HTML. Hypertext Markup Language used for the creation and display of text and graphics on the Web.

Instructional Design. The systematic educational plan used to develop live face-to-face and online courses that involves effective, efficient active learning components and pedagogy.

Infrastructure. The basic foundation or framework underlying a system or organization for the technologic, operational, and personnel support for academic computing networks.

Interactivity. The method or tool used to engage a computer user with the content of a course to help with the learning process.

Interface. The computer connections that allow hardware and software programs to operate and function properly with the user.

Internet. A global Transmission Control Protocol (TCP) network of millions of computers for access and transfer of communications and information.

Internet Service Provider (ISP). An organization formed to give services involving computer user access to the Internet at varying processing speeds through computer networks for a fee.

Learner Support. An educational system comprised of computer or personalized access designed to assist students with technical information or online course access problem solving capabilities.

Multimedia. The combination of electronic technology applied to the form of television or computer screen interface involving text, sound, graphics, photographs, animation, or motion video and controlled through a computer.

Network. An electronic system of software and hardware connections used to link and share computer data storage devices, peripherals, and software.

Portal. An intranet or Internet site that unifies a range of free educational resources, content, or news into a gateway of topics, subjects, courses, knowledge, or information for learners and organizations in exchange for the viewing of paid advertising (Mantyla, 2000).

Server. A computer used for dedicated network resource management of file access and storage.

Synchronous Learning. An informational exchange that takes place in a real-time environment, either live or electronically, through interactive collaboration with instructors, peers, or participants in dialog, discussions, and problem solving.

Web Course Delivery. Instruction involving the use of computers networked on the Internet between the teacher and learner for the interaction and participation in knowledge components.

World Wide Web (WWW). A system of Internet servers that provide access to sources of text, graphics, and multimedia data that can further connect through hyperlinks to additional information resource sites.

CHAPTER 2

A REVIEW OF LITERATURE

Introduction

Literature related to the inquiries of this study includes not only the subject of Web course delivery, but also several connected areas including system infrastructure, the computer, Internet, course management, instructional design, and institutional management of the system. Each area researched is an important component of Web course delivery, thereby providing a variety of information considered for the compilation of a rationale for including the use of Internet in the educational process.

A Historical Perspective

According to Van Houweling (2000) the present day Internet has technologic roots back thirty years or more to a U.S. Department of Defense ARPANET project in 1969 when two computers first exchanged informational data. In 1986 the National Science Foundation's NSFNET linked five national supercomputer centers based on technology developed for the ARPANET. The NSFNET grew and expanded quickly by connecting university and college campuses in the United States. The individual campus networks then expanded to link larger, more diverse academic communities. The NSFNET as a backbone communications network was decommissioned in 1995 but a significant portion of its underlying technology and ARPANET is the basis for the Internet, which then began as a primary commercial communications medium and link.

The use of two-way communications technology between students and teachers separated by distance usually characterizes distance education. That could be considered the first phase of distance education (Mills, 1999). Phase two could be identified as the near universal access to communications technology over distances. The third phase could now be characterized as the use of communications technology for the purpose of linking students and teachers through synchronous or asynchronous interaction for learning.

The creation of the Open University in 1969 marked a major change in centuries old correspondence instructional methods (Perry, 1976). The names for correspondence learning have transformed from open, flexible, distance, and resource based, to the present day distance learning terminology (Lockwood, 2001).

Advertisements for a distance education composition course through a Swedish newspaper trace back to 1833, and in 1840 an English newspaper was the vehicle for shorthand instruction (Simonson, Smaldino, Albright, & Zvacek, 2000). A few years later the Phonographic Correspondence Society formalized the approach, which later led to the formation of Sir Isaac Pitman's Correspondence Colleges. Language correspondence study later took place in Berlin. In 1873 in Boston the Society to Encourage Studies at Home was founded by Anna Eliot Ticknor, which had more that 10,000 students over 24 years in classical studies with monthly correspondence with teachers for guided readings and frequent tests.

Simon (2001) points out that from 1883 to 1891 the Chautauqua College of Liberal Arts was authorized by the state of New York to offer academic degrees based on correspondence courses. William Rainey Harper, a Yale professor, headed that study program. In Britain the correspondence institution of Skerry College in Edinburgh was founded in 1878, and University Correspondence College was founded in 1887 in London. In the United States, Illinois Wesleyan in 1877 offered B.A., M.A., and Ph.D. degrees modeled after England's instructional models. From 1881 to 1890 there were 750 students enrolled with 500 degree seekers. In 1906 the program was terminated due to concerns about quality. The University of Chicago through the University Extension Department offered correspondence courses between 1890 and 1892 reaching a peak of 125 instructors teaching 3,000 students enrolled. Faculty interest and enthusiasm waned in part due to finances and public response became minimal. Correspondence study ended after eight years at the University of Wisconsin in 1899 under similar circumstances within the institution.

Throughout this period of distance learning experimentation two basic philosophies seem to have emerged. The University of Chicago represented a more structured weekly lesson schedule approach, and schools in Sweden represented liberal correspondence programs of self-pacing.

Other United States early adopters of distance learning programs included: Pennsylvania State University, Department of Distance Education founded in 1892;

University of Florida in 1903; University of California Extension Center in 1990; and the University of Alaska, Fairbanks in 1970 (Picciano, 2001).

Present day technology seems to have overcome obstacles of distance and time in any correspondence education concept with speed and immediacy of interaction among and between teacher, students, and the wide scope and access of educational resources. According to a report by Schmidt (2000), the Open University in Britain had 168,000 students globally and in the U.S., the University of Phoenix had over 40,000 students and no campus. It was estimated that 50% of the total community college student enrollment and 35% of four-year college student enrollment would be served by software in the near future.

J. E. Eisele and M. E. Eisele (1990) present a capsulated history of technology in education that begins with evidence of early cave drawings that supplemented the spoken word used for storytelling. Next came written language that was supported with paper and writing instruments for hand scribed manuscripts. Later, the parental role of home education and socialization of children was formally shifted to teachers and schools. The technology of the printing press permitted the mass production of books as the base for teaching. At another point, electronics were introduced into education in the form of radio, television, tape recorders, calculators, and computers. Lastly, advances in electronic communications technology and personal computers have cleared the pathway for present day online courses.

Technology in Education

The use of technology in education has placed new demands on faculty. Rutherford and Grana (1995, p. 82) suggest that because of technology, "learning is becoming more active and less authority-dependent." Students are able to search and find their way to knowledge through technologically accessed information from instructor, classmates, and Web-based resources. Fender (1994) states that, "...technology offers enormous potential for involving students in active learning, especially through group projects." Students now have options to just passively sitting through chalk-talk lectures. With instructional technology capabilities, faculty who were accustomed to teaching only as they themselves had been taught, now need to adjust to becoming a facilitator rather than being the gateway to knowledge.

In general, the use of technology has brought a shift from knowledge (sometimes just for its own sake), to information literacy – the ability to process and use information. For example, some complex traditional content or processes that would have required in-depth knowledge base and explanation for full understanding have been reduced to the press of a key function. The educator must now determine how much explanation is necessary to communicate full knowledge and understanding of a process or concept.

With the use of technology in education, faculty time and concerns can tend to shift toward issues of having enough student workstations; the correct software and hardware configurations and upgrades; classroom network capability; continuous institutional server access; internet resource access; student support; and lastly, will the

equipment function as hoped and planned. For some faculty, what used to be a lecture preparation has now become an online orientation for students to access and use their curriculum design through Web-based instruction. This process involves knowledge of both instructional content and technologic delivery. Other technologic issues that can involve faculty include the use of interactive television instruction, student e-mail, Internet, computer software language for Web course design, and electronic library resource access.

Because of technology, faculty members are dependent on administrative and technical infrastructure systems that can impact curricular decisions within academic institutions. Traditionally, most curriculum decisions by faculty centered on the choice of textbook, course content, and available classroom resources and space. Support for instructional delivery generally consisted of low budget items and were handled within a department. The use of educational technology has created a dependence of faculty on larger administrative or outside funding to provide adequate classroom workstations, hardware and software upgrades, peripherals and maintenance, and technical support, all of which can require large and regular budgetary support, approval, and long-range planning. The system infrastructure and technical support involves personnel for responsibility of classroom and equipment configuration for network access to courses, software, printers, online courses, telecourses, hardware installations, and general trouble-shooting and maintenance of technology.

For some faculty, technology represents time lost in going backward to go forward in redesigning instruction for courses already developed and being taught in traditional live classroom environments. For others, it represents time and trouble with continual adjustments to course curriculum based on software change or instructional methods. These situations have become routine for faculty in some academic areas that have become nearly dominated by computer technology, or for those faculty who have chosen to embrace the change of technology in education.

A fundamental issue that confronts faculty today is whether to transition to technology regardless of whether it is efficient or practical. As Cottle (1995) points out, some instructors continue to ask if technology enhances learning. Some faculty may sense an obligation to use technology in the classroom just because colleagues use it or administration supports those who do. For some faculty and administrators, technology in education represents a self-lesson in humility, as some students are more technologically adept than those in control of technology in education. As the continuous application of technology to instruction evolves it may change in form but it will not go away. Instead of ignoring or becoming intimidated by technology, educators must embrace it and make technology relevant and useful in teaching (Johnson, 1994).

The rapid movement of some academic institutions toward the use of the Internet and online courses can be attributed to a variety of issues. Some institutions see it as a way to attract students who might not otherwise enroll, or as a way to address the needs of new student populations. In either situation there is an attempt to reduce or control

costs, meet student needs, improve quality, and be competitive with other institutions (Palloff & Pratt, 1999).

Stakenas and Kaufman (1981) point out an important distinction between the means and ends of the educational process. Many educators have allowed instruction to become an end rather than a means or process. They maintain that instruction through the use of technology should be viewed as the means to student learning and achievement which requires a shift in focus from instruction to thinking about what learners are supposed to achieve as a result of instruction.

Thompson (1999) expands the concept of infrastructure from just a service provider of information technology, to include the efficient and effective management of the instructional delivery system. She differentiates the frustration levels between a technology enthusiast and an adopter when there are delivery problems with the online course system server or network infrastructure. Due to levels of infrastructure understanding and comprehension an enthusiast may perceive technical problems as minor hurdles that come with online course culture but an adopter may not view the same technology problem as trivial. The adopter becomes easily tempted to just give in and revert to more familiar, less time consuming, less technologically demanding, less frustrating, and more traditional instructional delivery methods.

Hayden & Torkelson (1973) point out that educators should keep the concept of technology in education in proper context. Technology should not be viewed as a threat to education but as a facilitator to instructional content planning and delivery for

improved teaching and learning effectiveness to both educators and students. Planning for the use of technology in education still involves factors common to live classroom instruction. Teaching objectives need to be established, learning characteristics need to be considered, instructional resource materials, content, and methodology need to be planned, and evaluative assessment must be planned for learner responses. The integration of technology with other forms of learning and the new educational paradigm involves the combination of pedagogy and effective teaching in relation to learner and teacher roles (Tschang, 2001).

Traditional technology products in education range from the use of supplements in the forms of printed text, visual pictures, charts, graphs, overhead projections, photographic slides, film loops, movie films, television, audio recordings, to current day interactive computer networks (J.E. Eisele & M. E. Eisele, 1990).

Computer technology in education breaks geographical and time barriers which enable students to learn from anywhere at anytime thus offering cost saving potential for child care, gasoline, parking, and loss of wages to attend live classes (Castellucci, 2001). Students are also able to learn at their own pace and from students potentially from more diverse backgrounds and distant places. Online students also have the potential for developing their computer use and Internet research abilities, reading, writing, and communication skills. Students also have the ability to take online courses from various educational institutions.

Distance Education

Distance education can be defined as the application of the principles of good instruction to a situation where the educator and student are physically separated. According to Martin, Moskal, and Foshee (1995) the primary emphasis of distance education should be on good quality instruction, not on the distance factor. Glitzy special effects of technologic wizardry cannot disguise poor instruction or weak course content. The basics of quality instructional design may involve student interaction and participation, active learning strategies, student feedback, and visual materials with graphics. Distance education involves detailed planning and design of student activities and learning assessment prior to beginning instruction of an online course. Traditional live student contact classroom instruction may offer more flexibility for curriculum change during a semester. Albrektson (1995) notes that although a deliberate attempt should be made to humanize distance instruction, research has not established a clear finding as to whether the instructor should or should not attempt to meet distant students in person, face-to-face, at some point. Adler and Rae (2002) recognize that current software technology advances and knowledge of human/machine interactions will permit the creation of personalized learning environments. To simulate the best learning experience possible, each individual would receive the delivery style that reflects the student's learning needs. Possibly, a digital mentor would function as an online learning guide to assist whenever needed.

Distance education is reliant upon institutional system infrastructures for providing instructors, technical support personnel, and administrators with the knowledge and understanding of what is involved in distance course planning, equipment, and student support needs. Martin, Moskal, and Foshee (1995) state that not all types of courses fit the distance education concept. Typically high demand, cognitive (mental rather than physical, psychomotor) courses with low curriculum modification would be most desirable. Identifying the types of learners suitable for a distance course should be considered in terms of having necessary pre-requisite knowledge, positive attitude and motivation, and whether they are in a required or elective environment. Basic logistical considerations for distance education involve institutional financial support, technological resources of hardware and software connectivity, technical support personnel and site facilitators, and time factors for course planning and designing, as well as network system capabilities for prime time course transmission.

Distance instruction is more difficult to design than traditional live classroom instruction and it requires dividing complex information into small chunk units; providing advance organizers (handout materials) to minimize note taking; and planning both online (live) and off-line activities such as, instructional games, role-plays, case-study problem analysis, and group peer teaching. "People are basically saying we need more support. Teaching 30 students in a distance-learning class is a lot more work than teaching 30 students in a classroom," states Boggs (1998, p. 17). It is clear that technology initially enables learning but it needs the support of effective and adaptable

system infrastructures to be effective. Research in the industrial sector indicates that improvements in levels of technology do not necessarily improve an organization's functioning. Technology has created a shift of attention away from the instructor's performance to a focus on a learner-centered experience involving effective content and delivery methods.

Graham Spanier (2000), President, The Pennsylvania State University, and Chair of the Commission for Information Technologies of the National Association of State Universities and Land-Grant Colleges, points out that the next generation of digital networks will transform higher education through increased access, flexibility, outreach, and active collaborative learning. Institutions of higher education cannot afford to be left behind in taking advantage of advanced technology to integrate learning into the lives of student consumers.

Use of the Internet for distance education significantly changes the roles of the instructor and student. It does not diminish or change the instructor's status as content expert but it does cause a change in how content is delivered and the skills needed to do that. Students become challenged with new roles as responsible active learners with the use of Internet instruction. For example, distance education allows for open, flexible, mixed mode, peer, and mentoring forms of content delivery when the Internet is part of the expanded educational environment. Forsyth (1998), points out that with all of the teaching options of the Internet for distance education, traditional education could be

characterized as being a closed, rigid, framework with time constraints established for the convenience of administration as opposed to producing positive outcomes for learners.

Frick (1991), attempts to keep the use of technology and distance education in perspective with a systematic approach involving teacher, student, content, and context. Whether in live face-to-face or from a distance any educational process requires four basic and essential elements for education to occur. A qualified, willing teacher is necessary to guide and lead through presentations, demonstrations, giving assignments, directing toward information, asking and answering questions, giving constructive critique, evaluating, and assessing progress among other responsibilities. The functions can occur either live or from a distance. A properly placed student who is a responsible, active, and intends to learn is needed to receive and interact with the teacher and educational material whether live face-to-face or from a distance. Educational content is necessary whether it is presented directly by the teacher in a live classroom or from a distance through a wide variety of pre-selected resources. Lastly, the context for education to occur can be in the live classroom environment at a set time and day, or at a computer stationed in the home, or wherever accessible, at any time, day, or night.

In continuing the systems approach to education, live classroom instructors are challenged to consider and assess how technology applications and distance education can be implemented personally through the models of: teacher-student relationships; student-content relationships; teacher-content relationships; student-context relationships; teacher-context relationships; and content-context relationships. The model provides a

self-directed approach for teachers to consider how easily technology can be implemented in the process of transitioning to distance education.

Much of what distance education provides to students today is what Holmberg (1982) identified from studies that facilitate internalized student conversation. Students have stronger feelings of personal relationship with the supporting organization when stronger characteristics of guided didactic conversation exist. Students exhibit greater personal involvement when they feel strongly that the supporting organization is interested in making study material personally relevant. The student's exhibit stronger motivation and more effective learning when they feel strongly that there exists a personal relation with the supporting organization and the study material. Of the many interacting variables, factors, and considerations of technology in distance education, the one most valuable contribution may be the ability to respond to individual differences of student learners (Pratt, 1987).

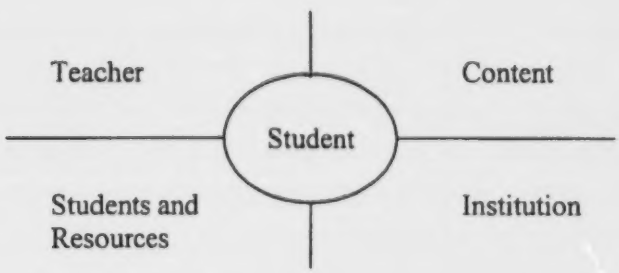

Figure 1. A Proposed Learner Centered Paradigm Model

Interactive online distance educational environments place the student as the central person in the learning process (Jansen, Fisser, & Terlouw, 2001). This concept is consistent with learner-centered paradigms in education. A proposed learner-centered paradigm model is shown as constructed in Figure 1.

Distance Learning

Distance refers to geographical separation but it can also apply to conceptual intervals that separate people, countries, cultures, and knowledge over time and space. Learning could be identified as the transference of information, knowledge, or experience through time and space. Education is a process of bringing together or closing those geographic or conceptual distances for an exchange, collaboration, or integration of experiential domains. Fukuda (1997) notes that without two-way processing of information and exchange that the concept of infrastructure is centralized. Present computer technology and Web infrastructure permits fully interactive exchange environment. Presentation type systems of education tend to remain in the stage of one-way transference of information and knowledge between teacher and student. Distance learning offers the potential for full two-way interaction of information and knowledge among teacher, student, and remote resources to a high degree. By overcoming time and remoteness the networked computer has become an active dynamic force in distance education by providing a new and interactive means to decrease the gap between conventional and distance learning methods (Simoff & Maher, 1997).

Distance learning is not a new concept, as correspondence schools have existed since at least the early 20th century. Research by Chartier (1989) indicates that distance learning started with Gutenberg's invention of the printing press around 1450 A.D. when books became circulated containing the writings and knowledge of great authors. Monks who transcribed texts were critics and complained that printed books were of poorer quality and would not last as long as their hand-crafted originals. Trithemius (1494) noted that they were correct but it still did not save their jobs.

In December 1991 the Research Study Group on Advanced Technologies Applied to Training Design (RSG-16) was established by Panel 8 on the NATO Defense Research Group (Seidel & Chatelier, 1994). The RSG-16 met in a 1993 NATO workshop and concluded that distance learning has been used for generations but the opportunity and challenge is now for nations to integrate computers and technologic networks to take advantage of a modern comprehensive distance learning program.

According to Seidel and Chatelier (1994) components of designing a comprehensive distance learning system included: a. the context for the targeted learning – this would include the nature of tasks (i.e., individual, team, cognitive, behavioral, etc.); the time frame in relation to the number of students; and the nature of the learners (i.e., introductory, intermediate, advanced, individual, groups, etc.). b. the organizational culture – this would involve traditional, hierarchical, level, shared, participatory; the roles of the participants (i.e., students, instructors, administrators, etc.); and the expectations of costs, changes, and facilities. In this context, distance education

would refer to connection and access to the educational media and learning resources provided to remote learners. Distance teaching becomes the role of the instructor in the educational process, and distance learning becomes the student's role. In this distance education paradigm for learning the instructor serves as facilitator or guide in designing and leading teamwork and collaborative learning experiences. The instructor establishes focused outcomes and shared goals that provide students with active, meaningful learning experiences, interaction, and responses.

Distance learning is also flexible learning as discussed by Kirkpatrick and Jakupec (1999). They point out that with the use of technologic innovation in education that the creation of flexible learning increases efficiency. This more efficient technologic education system, they believe, could result in the commercialization of knowledge. Flexible learning is a competitive edge that provides an access advantage over traditional educational delivery systems.

Robinson (2001) points out that the problems with innovating open distance learning show some consistency regardless of the variety of institutional cultures, contexts, and applications. In her study of 426 individuals involved with introducing and implementing distance learning between 1996 and 1999 the areas of resource availability, organizational issues, human resource capacity, and the use of technology surfaced as problems. Distance learning initiatives were not adequately understood or supported in financial or in personnel terms. There were inexperienced, insufficiently trained, and under-staffed support personnel in distance learning, and inefficient planning for

scalability of growth and expansion of equipment, procedures, and processes within the educational institution. The lack of a clear organizational structure and an internally coordinated distance learning effort allowed for fragmented and splintered segments, or individual initiatives of online course development to occur. Interestingly, sometimes the mainstreaming or institutionalizing of the distance learning initiative would cause individual interest and enthusiasm to decline due to the loss of the pioneering, self-accomplishment, and innovational spirit. A need was identified for clear agreements and definition of roles and responsibilities, and for teamwork and collaboration across academic departments and administrative divisions for distance learning to be effective. Technologic issues centered on lack of expertise and technical support of staff; the choice of technology which may have been based on an individual selection, availability, or affordability but not for reasons of appropriateness for use either by faculty or students. Lastly, there was little evaluation of distance learning efforts or effectiveness of teaching and learning. Some distance learning information had been gathered but not evaluated for assessment.

Belanger, Jordan, & Hamilton (2000) list the expected benefits of distance learning with reference to the learner, instructor, and institution. Learner's benefit through access and flexibility of education, choice of institution, access to distant experts, which may result in opportunities for promotion, advancement, and lifelong education. Instructor benefits include having increased student participation, and broader time frame for course delivery to students. Institutions benefit through potential for increased

simultaneously as it did with six or seven courses in the infancy stages of growth and development? Will the instructor's course delivery plans be as effective and manageable with fifty or sixty students enrolled as it did with fifteen or twenty students when the course was initially taught? Is the institution ready for this type of expansion with available resources of finances, technology equipment, competent personnel, instructional design, learner support, and instructional support?

Supporting reliability of online courses is a key issue for faculty, students, and institutions in determining the success of computer technology in distance learning. For example, in a traditional classroom learning environment if the teacher does not speak clearly, or writes illegibly on the board, or if there are distracting noises, they are unacceptable to the learning process, notes Al-Shaer, Youssef, Abdel-Wahab, Maly, & Overstreet (1997). Similarly, in computer-based online courses, problems such as network server failures, loosing saved information or work on a computer disk, or random, unannounced system crashed degrade the education process and create serious doubts and reservations about technology and online course delivery. Al-Shaer, et al, (1997) suggests that reliability is one of the key issues that may determine the success of the computer technology in distance learning applications.

As educational institutions move further into the development and use of online courses there are many new challenges placed on the technology and support staff infrastructure. Reliability and scaling levels are greatly effected when technology systems and support staff that are designed for several hundred users are asked to process

and support the transferal of data of students and instructors for online courses that have developed to several thousand. As indicated by Griffiths and McCord (2001), the explosive growth of network technologies over the past five years has transformed Internet use from viewing small Web pages to accessing sophisticated search engines and library resources. In addition, campus administrative applications dramatically increased system usage and the dependence on system reliability, support, and scalability have become critical factors for effectiveness. Institutional technology can be considered the invisible electronic backbone of educational processes and it is most successful when users are not complaining about network response time or system availability. A campus leader does not need to be an expert in network technology to prepare a campus for online distance education and learning but it does require that a personal interest be taken to ensure orderly, coordinated processes of planning and implementation (Long, 2000).

Long (2000) identifies several critical success factors of system infrastructure for educational institutions involved with online courses course development and delivery. Planning and evaluation should consider technical issues of function and capacity related to reliability, scalability, and security of systems in addition to management and response to system failures. End-users, particularly students and faculty members, must have a clear point of contact for questions or problems that may arise. A system infrastructure model should be consistent and compatible with the campus culture and attitudes toward online courses and distance education processes. Flexible and on-going network policies for growth and security are important and need to be clearly established across the

institution. Service agreements with the end-user in mind should be developed regarding user expectations of performance, help, and maintenance. Aggressive recruitment, competitive salary scale, continuous professional development, and retention of in-house technical support personnel are important to system infrastructure and en-use confidence.

Kirkpatrick and Jakupec (1999) emphasize that the success of technology-based instruction is dependent on sufficiently provided infrastructure to support instructional hardware and delivery. Educators are inclined to persevere with new instructional technology approaches when they feel secure that it is more likely to function properly rather than fail. Educators and students at one school reported frustration with technology that did not function as expected.

Dolence and Norris (1995) stress the importance of a strong management infrastructure to mainstream technologies into the educational system. This process would involve the integration of technology into existing processes procedures through strategic thinking and planning of the institution. Thompson (1999) supports the concept of a strong management infrastructure with regard to using outside grant dollars to seed the development of educational technology. With a weak management infrastructure the beginning technology can raise expectations of educators to develop online courses and then over time the support and infrastructure may gradually dissolve to either a total lack of support or marginal development and growth of a system infrastructure. Even a strong management infrastructure that has been mainstreamed into the educational institution must be supported with effective professional development of the instructors. This

approach would include the need for technologic training and instructional design debates and discussions about pedagogical issues. The educational online adopter seems to seek straightforward and user-friendly applications with a slow, gradual learning curve.

McLachlan-Smith and Gunn (2001) indicate that some educational institutions can be viewed as strong on talk and gestures, but weak on implementation through the revision of infrastructure, resources, training, support, and quality assurance of online course content.

Errington (2001) identifies teacher beliefs on flexible distance learning as an invisible system infrastructure that needs administrative attention, nurturing, and support just as any necessary physical resource. Teachers need to come to self-realization and understanding, and believe that flexible distance learning is relevant, meaningful, connected, and central to what they and the institution are committed to accomplishing.

Institutional Readiness Factors

The readiness factors for online courses at an institution are to be considered as Yarger, Tackle, and Taber (1996) point out that the thought of transforming a conventional college course to the Internet platform can be very intimidating to an instructor not familiar with the process. Ammar (1997) suggests that teaming instructors with colleagues who have transformed courses to online provides a support group for helping to speed up the readiness process. The design and development of online courses will involve the use of the Internet as a learning environment and resource. Norman and

Spohrer (1996) point out that traditional structures will be challenged as the Internet will change how people will be educated, how they learn, and how new knowledge will be acquired. The learning institution will need to be ready to accommodate and support such changes as the relationship between the instructor and student, how the classroom is structured and equipped, and how instructional materials will be developed.

The evolution of the Internet has enabled numerous new opportunities for students and educational institutions with online courses designed in more interactive ways, remote resources can be integrated into regular curriculum, instantaneous student assessment is possible, and interdisciplinary work can be stimulated as noted by Franze, Neumann, Schill, & Stocker (1997). Infrastructure planning and cultural change of an educational institution must be integral with campus academic planning. A key feature of institutional readiness must include the integration of technology planning with academic planning and be at the core of new application system planning. Griffiths & McCord (2001) suggest that chief information officers responsible for institutional technology planning must share the task of monitoring technologic developments and that it be administratively supported with a collaborative organization structure.

Research by Goodman (2001) reveals that on an international level there are strikingly common technologic challenges facing educational administrators across a diverse group of institutions in diverse countries. He notes the profound impact that the technological revolution is having on the educational process and that an underlying theme of concern is how to react to or adapt to technology to fit the mission and goals of

the educational institution. Primary questions that exemplify the educational administration challenges are as follow:

How are resources obtained to respond to the constant change in technology?

What optimal infrastructure designs should be used with available funds?

What strategy should be employed for technology to provide more access or enhanced learning opportunities?

Why should instructors change their approach to learning?

What evidence is there to show that technology driven education improves learning?

Reddy & Goodman (2001) point out that serious discussions and work will be needed to address critical issues of how to design, align, and implement changes across human, organizational, and technological infrastructures. Within more than 10,000 institutions of higher learning in the United States, including small community colleges, there are differences in goals and missions that pose real challenges to institutions readiness for technology and online course development and offerings.

Web portals now permit the buying and selling of education, as for-profit companies are brought into direct contact with public non-profit educational institutions, faculty, administrators, and students, thus merging e-commerce with e-learning (Larson & Strehle, 2001). The concept allows for the packaging of online distance courses to be judged based on content, quality, effectiveness, and appeal for purchase and then re-sold as course and curriculum offerings through educational institutions. This collaboration of

e-commerce and e-learning eliminates direct instructor costs, use of classroom facilities, and overhead costs to theoretically provide the best course, curriculum, presentation, and learning in the form of the best cost-effective education. Whether educational institution infrastructures are prepared and ready to merge those marketing concepts with vision and mission is yet to be determined.

The demand for lifelong learning and education continues both from individuals and the industry employers that comprises a huge potential market for emerging corporate educational entities. E-commerce for educational institutions that are ready to meet the challenge can mean educational and electronic commerce (Barone & Luker, 2000). It helps to keep the commercialization of education and learning in check by reminding that we must resist using technology just because it is available and that we must use it only when we can see how it will enable us to do the educational job better (Simon, 2001).

Some educators may view distance education as a mixed opportunity with its potential threat to job security, and the competing capital investment issues (Redding & Fletcher, 1994). In retaining a culture of competent educators but at the same time lay the foundation for an educational technology superhighway it is important to consider that distributed education will not eliminate the need for qualified instructors as they will be needed to administer the courses as subject matter experts to the students, and educators can be compensated for teaching larger numbers of students.

Griffits & McCord (2001) point out that because institutional technology infrastructure is a nearly invisible and unexciting component of online education it often becomes easier to convince administrators to invest large sums of money in the perceived features of a distance learning initiative rather than smaller sums to upgrade or expand underground cabling facilities to improve network capabilities for enhancing online course communications.

The National Learning Infrastructure Initiative (NLII), an EDUCAUSE program, was formed to help develop institutional readiness for change in institutional technology by addressing issues of policy, culture, support, and infrastructure in higher education. The Instructional Management System (IMS) was conceived to function as a key element of an educational technical infrastructure to establish standards for quality, access, and affordability of modalities for teaching and learning (Barone & Luker 2000).

In a network-based learning environment the roles and relationships between and among faculty members, students, administrators, vendors, and publishers will change. Students will need to take more responsibility for their own course choices and learning. Massy (1998) projects that faculty will become designers and managers of teaching and learning processes and content specialists.

Bagnara (1994) pointed out interestingly that theories of learning tend to stress the importance of social and organizational factors but that socio-technical relationships are often ignored in the development of institutional technology within the social and

organizational setting. This is significant as it is well known that certain technology may be highly effective in one organization and yet be quite useless in another (Butera, 1987).

In assessing professional types within various technologic organizational models there are three identifiable managers or administrators (Bagnara, 1994):

a. Social – those who excel in the introductory stage of technology and organizational change but are best recognized for their competence in human relationships within the framework of institutional culture.

b. Super-professional – those who have recognized competence in technology equal to or beyond that of their collaborators and exhibit an orientation toward the use of information technology. Their emphasis is on innovative procedure or goal achievement.

c. Entrepreneurial – those who attend to the coherence among technology, organizational culture, and human resources. Their emphasis in on the discovery and use of technologic opportunities within the dynamic culture of the institution. They are agents who propose and carry out goals and change in addition to creating and forming the conditions to achieve them.

Distance learning should be viewed as a service system with organizational characteristics that are dependent on the internal infrastructure and on external demands of the student market. This concept calls for a technologic infrastructure that is coherent with its learning products and processes provided in meeting a selected segment of students who are likely to enroll. The system infrastructure that what works for one

institution may not be the correct answer or solution for another. Information and knowledge in one institutional context can become merely data in another. Hampden-Turner (1990) point out that institutional culture guides the interpretation and use of information that determines the sphere of decision-making. Even the most advanced technologies need to be profitable for the institution.

Stakenas and Kaufman (1981) view educational technology as neutral devices that are not dehumanizing tools in distance learning. The ultimate outcomes and impacts of the utilization of technology in education depend on the intent and philosophy of the educators and administrators responsible for determining curriculum and delivery methods. The culture of the institution will also determine the degree and level of receptiveness to introducing new learning methodologies within conventional education systems. Tait and Mills (1999) indicate that adequate financial investment and support within the institution is important to the change process or suspicion and resentment of educational technology may develop with teaching staff and students.

Early adopters generally comprise about 10 per cent of the academic staff but they have an important role in the educational change process. Johnston (1999) calls for leadership to support early adopters by creating a context and institutional environment that is conducive to supporting change to online and distance course delivery. Staff development and support are vital links to instructional comfort levels, encouragement, and support for online course development and delivery.

Distance or flexible learning has important implications and requires a changed culture of acceptance and implementation at a college. Technologic activities, backup, and support structures are necessary in providing a framework and clear direction for continued growth and development (Kirkpatrick & Jakupec, 1999). Personnel with knowledge, skills, and dedicated time are needed for support of online courses. Faculty development forums in instructional design are needed along with reward systems of acknowledgement for positive efforts in online courses.

A study by Robinson (2001) showed that organizational change issues were key factors in the introduction of open distance learning among educational institutions. Two-thirds of the institutions were gauged to be slow to reluctant in making necessary changes to facilitate online distance courses. Strategies of online course leaders involved working around existing rules and procedures based on personal relationships established with key administrators and taking on much of the new work that was necessary to make institutional change. Some of the key readiness factors reported were: restructuring of existing practices and processes; establishing new work relationships that crossed existing faculty and administrative boundaries; reallocating funds and modifying financial decision-making to provide necessary technology, instructional design and support staff for online courses; creating new curriculum and assessment methods by faculty; awareness of new communication and interaction with learners; and lastly, changes in values and culture of the institution including revised job descriptions, roles, skills, and expertise of existing or new positions.

A summary of a major study by Alexander, McKenzie, & Geissinger (1998) reported that successful distance technological instruction was affected by various combinations and contexts of project planning and management, production capabilities, staff expertise, technical support, and copyright issues between faculty and the institution. The single most important success factor for distance technology instruction was identified as instructional design of the students learning experience. Success was identified as addressing and meeting specific needs through enhanced learning in new ways with effective design strategy, assessment, and learner support. It could be concluded that whether the instructional delivery vehicle is flexible, online, technologic at a distance, or live face-to-face in the classroom environment, the content and instructional methodology remain important.

Picciano (2001) lists several principles of good practice for electronically offered academic degrees and certificate programs. The following principles would translate into institutional readiness factors. Curriculum and instruction should be coherent and complete as taught by qualified faculty and possess rigor and breadth appropriate to the degree or certificate offered. Real time or delayed interaction should be provided between faculty and students and among students. The role and mission of distance learning should be consistent with the institution and exemplified by the appropriateness of processes and technology to meet distance-learning objectives. This would also be demonstrated through provided training and support of faculty who use distance-learning technology and through appropriate learning resource availability to both students and

faculty. A commitment to support is also needed in institutional policies and ongoing financial and technical matters enabling students to complete degrees or certificates. Lastly, the institution should evaluate distance educational effectiveness through learning outcomes, student retention, and satisfaction of students and faculty.

Schmidt (2000) identifies additional good practices related to the actual instruction of distance courses. He notes the importance of faculty and student interaction through rich and rapid responses on assignments; an emphasis on the use of collaborative, team, and active learning; efficient use of student time working on challenging assignments with high expectations and high order, scientific method and critical thinking; respect for diverse ways of student learning; and comfort and familiarity with the information technology. Ultimately, the changes in educational delivery depend on the willingness to adopt technology and how it is administered within the institution (Amiri, 2000).

Components of an educational technology leadership-training program are identified by Kearsley & Lynch (1994). Through various objectives and topics the goal is to develop individuals with the understanding and capability of improving the educational system with strategic use of instructional technology.

A United States Army research project designed to help The Army Distance Learning Program (TADLP) reported that organizational readiness was quantifiably linked to the overall abilities, training, education, and morale of the individuals (Leonard,

et al., 2001). It was also reported that the organizational responsibilities included the ability to develop, train, position, and motivate the individuals to be able to do their jobs.

For more than ten years individual faculty members most often made a decision to introduce online learning (Moonen, 2001). With the growing popularity of online learning educational administrations have embraced the concept for reasons of economics, quality, and efficiency. Colleges do not want to lose students to other institutions offering online courses. With the instructional design focus toward developing online courses there is improved quality of the educational process. The offering of online courses allows the institution to be more efficient with financial and physical resources.

CHAPTER 3

METHODS AND PROCEDURES

Research Design

The major purpose of this study was to provide data describing current Florida community college system infrastructures related to the design, support, implementation, and administration of online courses. Specific emphasis was placed on finding how many Florida community colleges were moving toward, or already offering online courses. A sense of interest levels for online course planning and development were determined in addition to what infrastructure support methods were employed among various educational institutions. This study should provide critical, broad-based information, and various models needed for implementing and supporting the design and delivery of online courses. The study began in August 2001, and terminated in April 2002.

This chapter describes the planning, design, population access, and implementation of the study including survey population and setting, development of participant survey instruments, and structured interviews with selected personnel actively involved in and responsible for administering online courses. The elements were reviewed in terms of validation, data collection and analysis.

Population and Setting

Data collection methods and instruments used in this study were designed to obtain a broad range of information on personal experience and observations associated with online courses. The subjects selected for analysis included the 28 community college system representatives currently serving as members of the Florida Distance Learning Consortium. The involvement and perspectives of these individuals on their institutional organization, culture, experience, and needs were a primary focus of the study. The responsibilities of the individuals with respect to online course initiatives were examined and considered as relevant and informed responses on existing system infrastructure, needs, and operational functions.

The survey population mailing list (see Appendix G) was developed from three sources. A copy of the 2001 – 2002 Florida Distance Learning Consortium list was obtained from the Florida Community College System Web site and was matched against a more recent list that was in circulation from an annual meeting of committee members. Both lists were then matched with the 2001 Florida Community College Presidential listing. All three lists were checked, verified, and corrected for accurate and correct mail and email addresses, area codes and phone numbers.

The State Board of Community Colleges established the Florida Community College Distance Learning Consortium in July 1996 by adopting Rule 6H-1.046. The vision statement of the FCCDLC was formed in 1977 with the purpose of coordinating the establishment of a technology enhanced community college delivery system that

supported the mission of the community colleges and ensured maximum access to higher education for all Florida residents by utilizing instructional technology and eliminating the barriers of distance, time, and place.

The consortium structure is composed of 32 members: one representative from each of the 28 community colleges, two representatives from the Council of Presidents, and two members of what was the State Board of Community Colleges. The consortium was formed as an advisory committee of the State Board of Community Colleges, with appointed membership by the Board Chair who appointed the Chair of the consortium. The consortium Chair appointed any necessary committees. Administratively, the consortium was assigned to the Division of Community Colleges with support staff housed on the Florida State University campus.

The on-going purpose of the consortium is the coordination of establishing a technology enhanced community college delivery system that supports the mission of the community colleges and ensures maximum access to higher education for all Florida residents by utilizing instructional technology and eliminating the barriers of distance, time, and place. Consortium members serve on one of five standing committees as follow:

1. Issues committee
2. Course acquisition, selection, development, and evaluation committee
3. Technical support and emerging technologies committee
4. Instructional support committee

5. College partnerships and SACS committee

Consortium bylaws provide for administrative and operational oversight of the organization.

The consortium is directed to address issues relating to the following areas of distance learning: (a) access to courses; (b) time needed for students to meet their educational goals; (c) coordination of the acquisition, development and distribution of courses; (d) development of a distance learning associate to baccalaureate degree program with state universities; (e) an inventory of distance learning courses, staff development materials and support services; and (f) training efforts for faculty and staff, and related services involved with distance learning.

Survey Instruments

A nineteen-question survey was developed in October 2001 by the author for mail distribution as a primary data collection instrument (see Appendix A). Participant names were not solicited on the survey, permitting all respondents to remain anonymous. A live interview procedure was also developed for obtaining additional follow up and detailed information. Survey design, content, and validity were based on preliminary meetings and subsequent reviews with University of Central Florida research personnel and Distributed Learning staff. A combination of resources including University of Central Florida course work in qualitative research design and the doctoral seminar, Lake Sumter Community College institutional research and distance learning staff, reference material,

and dissertation committee review were all very helpful in forming and validating survey questions and content.

Initial survey questions related to online courses were the result of experiences with an online course initiative developed at Lake Sumter Community College, which also represented refinements suggested by the University of Central Florida Institutional Research and Interactive Distributed Learning staffs. Some additional changes in question content and form were suggested by the dissertation committee advisor and were implemented in the final instrument. In December, a pilot test and review of the question content and survey design was conducted with Lake Sumter Community College distance learning director and staff.

An introductory cover letter was composed to send with the first mailing of surveys stating intent, purpose, and contacts numbers for questions about the research. Although the cover letter contained a response section that would identify participants it was only used as an option for providing a copy of the procedure results obtained from the survey questions. A differing cover letter (see Appendix D) was also designed for a later second mailing if responses to the initial letter were not received within a seven-day period. The University of Central Florida Institutional Review Board statement of limited liability was included (see Appendix C).

In November 2001 the survey questionnaires were mailed with cover letters to the current distance learning consortium members. Based on a comparison of two recently compiled lists it was discovered in some situations that the personnel, phone numbers,

area codes, email addresses, and position titles had variations and some research was necessary for correcting and updating the information for accuracy. After verifying correct contact personnel a preliminary email was sent to the 28 distance learning consortium members alerting them that a survey would be arriving in the mail within a few days.

Each initial mailing was sent as a package including a self-addressed stamped return envelope and an introductory cover letter, a one-page statement of limited liability and the two-page, nineteen question survey printed on bright lime-green stock to increase visibility and attention from recipients other mail. The bright color also made it easier to reference the survey if a follow up phone call or email was necessary in referring to it. Some recipients made reference to having a stack of surveys to respond to and the bright color made it rather easy to identify in a stack for immediate attention.

In December, a cover letter (see Appendix E) and the telephone interview procedure (see Appendix F) were mailed requesting telephone interviews to be conducted with personnel at five different institutions who indicated on the returned questionnaire that they were involved with a large scale offering of online courses. Criteria for selection included the level of online course offerings and the size of the institution. Interviews involving a variety of online course infrastructure situations were of interest to the study.

The survey instrument (Appendix B) was designed to obtain answers to the following:

1. What incentives and rewards are there to motivate faculty in obtaining knowledge to develop and teach online courses?
2. What academic services and technical support are available to students enrolled in online courses?
3. What processes, procedures, instructional design, and technical support are there for faculty to develop and teach an online course?
4. What software, equipment, and facilities are being used for the development and delivery of online courses?
5. What levels and degrees of online course development exist in Florida community colleges in relation to the size of the institutions?

The questionnaire was designed to identify those institutions involved in various levels of online course offerings and to find how those courses were supported through system infrastructures throughout the institution. A broad general assumption of the study was that Florida community colleges were involved in different levels of online courses. The questionnaire and interview procedure were designed as partially structured formats to allow flexibility of coverage for both larger scale open-ended response issues of vision and mission of the institution to specific detail questions and responses of how online courses may have become part of the institutional processes at the college. Questions were designed to obtain information on:

1. Campus culture regarding online courses.
2. The status and value of online courses in various academic curricula.

3. The level of accessibility to online courses and support for user groups.

Analysis and research of historical surveys, dissertation committee review, preliminary coordination and administration of online course initiatives, and University of Central Florida Distributed Learning staff and professors knowledgeable about the roles and responsibilities of online courses helped to validate the survey instruments.

A variety of Likert scale, yes or no questions, and categorical check-off with open-ended fill-in formats were used. Three questions consisting of vertical Likert formats were utilized for ease of focus, involvement, and participant response factors. Neutral and clear wording of questions, and an organized overall format were carefully considered and implemented to facilitate participant responses. Six yes or no response questions were designed and utilized and a total of nine questions allowed for free response or other specified information as needed for accuracy. To encourage survey participation the two-page survey was designed as anonymous with clear, direct questions on an open, organized format with sufficient empty space, an appearance of functionality, and capability of estimated completion in fifteen to twenty minutes.

Data Collection

In November 2001 surveys were mailed to 28 identified distance-learning contact personal at each Florida community college. Lists of personnel were obtained from the Florida community college Web site and from the consortium member handbook. As mentioned, cross-referencing, updating, and correcting of information was necessary

through phone calls and emails to get accurate contacts, addresses, area codes, and phone numbers.

The first mailing was sent on November 21, 2001. Surveys were sent in 4 1/8" x 9 ½" hand addressed envelopes with instructions to complete the survey instrument (five to ten minute completion time was estimated), place the survey in a stamped, pre-addressed return envelope and return by December 4, 2001. This return date was specified to help encourage a response within ten days or less with the speculation that as more time elapsed the less chance for a timely response. Follow up emails and phone calls were made to encourage responses that were lagging.

As of December 22, 2001, 24 distance learning consortium members (85.7% of the population) had returned surveys. One unopened survey was returned as undeliverable due to an incomplete and conflicting address with a branch campus of the same college. A phone call was made directly to the individual to obtain the correct address and the survey was re-mailed. Final responses received and percentages are reviewed in Chapter IV.

Analysis of Data

Data were analyzed using SPSS, and Excel for Windows software and were categorized and tabulated in an effort to establish the prevailing conditions and levels of institutional readiness expressed regarding Web-course development and instruction at this point in time in Florida community colleges. An initial overview of responses were

tabulated and graphed in the list of Tables 1 through 19 to present a visualization of what was occurring dominantly throughout the community colleges. Codes were established in a spreadsheet format delineating variable labels and numeric responses for each survey question number. Results of descriptive data and assessment are reported in Chapter IV. Questions covered the following areas: (a) priorities of Web course development and support; (b) number of faculty involved in teaching Web courses; (c) number of Web courses and in what academic areas; (d) types and levels of support for Web course development and delivery; (e) length of time involved in Web course development and offerings; (f) which areas of the college dominantly support Web courses; and (g) what level of institutional processes are there to administer Web courses.

Organization charts were obtained as public information from Council of Instructional Affairs member representatives at eighteen Florida community colleges. The charts were used in determining which administrative areas of the colleges were primarily in authority and responsible for online courses. Because of the public nature of this information it was informally requested through email correspondence.

Distance Learning Consortium Member Interviews

Five personal interviews were conducted with current distance learning consortium respondents who indicated high levels of online course involvement and availability throughout their institutions and curriculum. All contacts were arranged as telephone interviews through the advance mailing of cover letters, a copy of interview

questions, and the UCFIRB Consent Protocol. The introductory cover letter, survey questions, and protocol information are provided in the Appendices. Inquiries included type of equipment used, levels of support, courses or programs involved, and how Web courses are administered. The data obtained from these interviews are recorded in Tables 1 through 19 and Figures 2 through 20 in an effort to provide case studies of community colleges where online courses are being provided and supported through established processes as part of the culture of the institution.

Structured interview format was closely aligned with information solicited on the survey instrument but was designed to probe further in obtaining expanded information and specific details. A series of 24 open-ended items were used. The structured interview question list is provided in Appendix F. Questions covered the following areas: (a) the formality of processes and procedures for online course development and offering; (b) consistency with vision and mission of the college; (c) implications of online course offerings at the college; (d) which instructors and departments are taking lead roles in Web course development; (e) the culture and readiness of the college for online course development and offerings; (f) a brief history of how online courses began at the college; and (g) attitudes of acceptance or resistance toward online courses at the college. Distance learning consortium member responses to these areas of inquiry are presented as descriptive data in the following chapter.

CHAPTER 4

ANALYSIS OF DATA

Introduction

The core purpose of this study was to provide data to describe and assess current system infrastructures and support systems that Florida community colleges used for administering distance learning initiatives as of fall semester 2001. The data collected made it possible to compare system infrastructures of how, and to what extent, online courses are being developed, supported, and implemented in Florida community colleges. Comprehensive data collection focused on responses from Florida Community College Distance Learning Consortium member representatives involving levels of online course offerings, faculty and student support structures, institutional funding, and the importance of campus cultural readiness through various forms. Of the 28 population members, one indicated by email that the topic of study was of high interest and there were at least three surveys awaiting response and that follow through was questionable. Another population member never responded to the initial and follow up mailing, email request, or phone calls. Approximately two weeks were allowed for surveys to be returned, within which time follow up emails and phone calls were used to encourage timely completion and response. Four methods of data collection were involved with this study as follows:

1. A Web Course Delivery Questionnaire was mailed to the population involving a system of 28 Florida Community college distance learning consortium members. Twenty-six college representatives responded, providing a 92.85% response rate.
2. Telephone interviews were conducted with five of the 26 institution personnel who responded to the mail survey. On the Web Course Delivery Questionnaire, these institutions reported offering high levels of online support and instruction.
3. Organization charts as general public information were obtained from 18 Florida Community College Council of Instructional Affairs representatives to determine how some institutions were structured to administer and support online courses.
4. Florida Community College System Web site information provided enrollment data for 2000 – 2001 regarding enrollment for size, rank and comparison purposes with collected survey data.

The exploratory and descriptive nature of the research questions indicated that both qualitative and quantitative methods would provide the most useable results. Individual questionnaire data was tabulated and arranged into tables for comparison. Qualitative data from the Web Course Delivery Questionnaire and the telephone interviews were included for comparison and analysis. Public information from organization charts and college enrollment rankings was listed for additional analysis and comparison. The information from each procedure and analysis was compiled in an attempt to identify trends relating to perceived needs to offer online courses, and the response to that need through system infrastructure support in the Florida community

college system. All frequencies, percentages, and individualized comments were compiled from survey question responses of the population completers.

Survey Item Analysis

The overall survey (see Appendix B) and specific questions were designed to first establish the level of priority for Web course development at a college with the first question. All other questions were intended to indicate the levels and actual elements of institutional support of the priority degree for Web course development. Question 4 directly related to the support response that should closely match responses to question 1 for the priority of Web courses at the college. Questions 2, 3, 5, and 14 were constructed to provide levels and breadth of online courses through numbers of faculty, academic areas, and years of involvement. Specific types of institutional support systems were then identified in questions 6 through 12, 15, 16, 18, and 19. Question 13 was designed to address possible institutional deficiencies or obstacles to offering online courses. Question 17 identifies possible positive or negative impacts perceived through offering online courses. Questions were purposely arranged to avoid obvious intent groupings, and also to encourage population response based on clear, accurate wording and ease of information being requested.

Response to Item 1

Web course development is a priority at your college. This item was designed to establish the general level of perceived commitment to developing and offering online

courses. A substantial majority of respondents (21 of 27, or 77.7%) indicated that they agreed or strongly agreed that the institution had established Web course development as a priority. Only 6 of 27 participants, or 22% were uncertain, disagreed, or strongly disagreed that Web course development was a priority at the institution. An overview of data related to Web course development as a priority is presented in Table 1.

Table 1

Web Course Development as a Priority

Value Labels	Frequency	Percentage
Strongly Agree	7	25.9
Agree	14	51.8
Uncertain	4	14.8
Disagree	1	3.7
Strongly Disagree	1	3.7

Response to Item 2

How many faculty members taught Web courses (either partially or fully online) at your college during fall 2001 semester? As stated previously, the sequence of questions 2, 3, 5, and 14 were constructed with the intent that the responses should substantiate and establish correlation to the first survey question. A total of nineteen

colleges (70%) had from eleven to more than 25 faculty teaching Web courses. This question was designed to provide information about the levels and depth of online courses taught in consideration with question three, academic areas; question five, years of involvement; and question fourteen, number of full-time faculty teaching Web courses. This response was consistent with and supported the 77.7% agreeing that Web courses were a priority. An overview of data related to number of faculty teaching Web courses is presented in Table 2.

Table 2

Number of Faculty Teaching Web Courses - Fall 2001

Value Ranges	Frequency	Percentage
1 to 5	8	29.6
11 to 15	3	11.5
16 to 20	2	7.4
21 to 25	4	14.8
More than 25	10	37.0

Response to Item 3

Which academic areas offer Web courses at your college? Please check all that apply,

including other, please specify. Item 3 was designed to establish the breadth of Web course involvement throughout academic areas of the college. The question was also intended to establish if certain areas of instruction were more likely or less likely to be offered online. English/Communications (12.3%), Business (11.1%), Humanities/Fine Art (10.5%), and Behavioral/Social Sciences (10.5%) were in the highest rankings of online offerings. Due to the nature of being dominantly laboratory-type courses, the Natural/Physical Sciences (10.5%) had a high number of responses. The academic areas of Computer, Computing, Networking, Computer Information Systems, and Computer Science had a combined frequency response of five or (2.9%) and were specified under other. Other categorical academic response areas are listed in Table 3.

Specific participant responses for question 3 under "other" were as follow: (a) computer science, (b) nutrition, history, technology, (c) computing, (d) continuing education, (e) computing, networking, (f) computer information systems, medical fields, (g) computers, (h) legal assisting, (i) complete A.A. degree, (j) early childhood education, (k) dental, (l) veterinary technician, emergency management, (m) WWW research (learning resource center), and (n) Spanish.

Response to Item 4

Support of faculty to develop Web courses is a priority at your college? This question was intended to relate back to item 1 for establishing a link response with faculty support that would be consistent with item 1 regarding the priority of Web courses at the college.

A frequency of 22 or 81.4% agreed that faculty support to develop Web courses was a priority, which was consistent with 21 or 77.7% responses in item 1 indicating Web courses were a priority. An overview of faculty support to develop Web courses as a priority is provided in Table 4.

Table 3

Web Courses by Academic Area

Subject Area	Frequency	Percentage
Humanities/Fine Art	18	10.5
Mathematics	16	9.4
Education/Physical Education	10	5.8
English/Communications	21	12.3
Behavioral/Social Sciences	18	10.5
Accounting	14	8.2
Natural/Physical Science	18	10.5
Business	19	11.1
Nursing	10	5.8
Criminal Justice	12	7.0
Other	14	8.2

Table 4

Faculty Support to Develop Web Courses as a Priority

Value Labels	Frequency	Percentage
Strongly Agree	6	22.2
Agree	16	59.2
Uncertain	3	11.1
Disagree	2	7.4
Strongly Disagree	0	0

A specific participant response for question 4 was written in the survey margin as follows: (a) not to a great extent.

Response to Item 5

How long has your college been involved in Web course development? Item 5 was designed to find a possible correlation between the numbers of year's involvement with developing Web courses and item 1, the level of priority for developing Web courses. It was also thought to establish a link between levels of infrastructure development and overall support for online course development and offerings. Most of the colleges, 85.1%, had only been involved with Web course development for one to five years. Only 14.8% of Florida community colleges had been involved with Web course development for 6 to 8 or more years. Table 5 presents information on the

number of years that Florida community colleges have been involved in web course development.

Table 5

Number of Years Involved in Web Course Development

Value Ranges	Frequency	Percentage
1 to 2 years	5	18.5
3 to 5 years	18	66.6
6 to 7 years	3	11.1
8 or more years	1	3.7

Response to Item 6

Which area of your college is responsible for Web course technical support of faculty? This question was designed to discover how various colleges were organizationally structured for administering and supporting Web courses since there may be overlap or crossover of academics and technical support boundaries. A majority of colleges (48.1%) indicated a departmental label of Distance Learning as the area of responsibility for faculty Web course support. One response was a combination of Instructional Technology/ Distance Learning. Another participant indicated responses for both areas of Teaching/Learning and Distance Learning. Institutional Technology was

indicated as a more moderate response (37%). Other responses included two labels of Instructional Technology, and one response each of Academic Computing, Management Information Systems, and Academic Technology. In connection with this item, organization charts were obtained from eighteen colleges to get a broader understanding of whether the various faculty support departments were ultimately controlled by academic divisions or other administrative areas of the colleges. Table 6 presents information regarding college areas responsible for Web course technical support of faculty.

Table 6

Area Responsible for Technical Support of Faculty

College Area	Frequency	Percentage
Teaching/Learning Center	3	11.1
Distance Learning	13	48.1
Institutional Technology	10	37.0
Other	8	29.6

Specific participant responses for question 6 under "other" were as follow: (a) instructional technology, (b) institutional technology, (c) academic computing, IT,

(d) management information systems, (e) the whole college, (f) instructional technology/distance learning, (g) academic technology, and (h) institutional technology and distance learning areas work together.

In relation to item 6 responses, the following examples of position titles represent organizational structures for the administration of distance learning courses and support systems of several Florida community colleges including the Florida Department of Education Office:

1. Vice President, Education and Student Development
   Director of Distance Learning
   Director, Academic Technologies
   Manager, Distance Learning
   Manager, Academic Technologies

2. President
   Acting Dean, Virtual College (position on hold)
   Director of Distance Learning and Television Production (present)
   Learner Support Center
   Advising
   Help Desk
   Student Information Center

3. Vice President, Academic Affairs
   Distance Learning and Curriculum
   Technology Planning and Training

4. Vice President for Academic Affairs
   Assistant Vice President for Workforce Development and Academic Technology
   Director of Distance Learning (position on hold)
   Applications Programming
   Internet Technology
   Institutional Research
   Technical and User Support

5. Vice President for Educational and Student Services

Provost of Main Campuses and eCampus
Program Director of eCampus
Instructors
Cyber advisor
Support Staff

6. Executive Dean
   Dean of Instruction
   Associate Dean
   Continuing Education/Distance Learning

7. Executive Vice President
   Vice President for Workforce Development
   Vice President for Academic Affairs
   Dean of Open Campus

8. Vice President for Academic Affairs
   Associate Vice President, Instructional Technology
   Director, Extended Learning Services and Non-Traditional Programs
   Director, Instructional Design (vacant position)
   Director, Learning Technologies

9. Vice President of Instruction
   Director of Learning Resources and
   Coordinator of Distance Learning

10. Vice President Educational Services
    Director, Center for Academic Technologies
    Director, Instruction and Curriculum Design

11. Vice President of Academic Affairs
    Director of Instructional Technology and Distance Learning

12. College Provost
    Coordinator, College wide Distance Learning

13. Vice President Instruction and Student Services
    Dean, Technology and Innovation

14. Vice President Curriculum Development/Teaching and Learning
    Director Educational Technology

Director Faculty Development Center/Technical Projects
Director Curriculum Design/Teaching and Learning

15. Vice President Educational Programs
    Dean of Learning Resources
    Distance Learning (vacant position)
    Instructional Technology Specialist

16. Vice President Academic Affairs
    College Provost
    Distance Learning

17. Associate Vice President Educational Services
    Dean of Distance Learning

18. Vice President Academic Affairs
    Dean of Distributed Learning
    Director Instructional Technology
    Director Staff and Program Development
    Instructional Technologist - 3 positions
19. The Florida Department of Education
    Commissioner of Education
    Deputy Commissioner for Technology and Administration
    Division of Technology

Response to Item 7

What learner support systems are available for students enrolled in Web courses at your college? This question was designed to gain further insight, additionally to question 6, regarding system infrastructure support of Web students at the colleges. Participant response patterns for learner support are primarily available to students in Web class orientations (43.1%), and lesser numbers indicating help line (27.5%). Other combined specified responses (22.4%) included student help Web pages, tutorials,

instructor email for technical support, and advisors/mentors. Information on learner support for students enrolled in Web courses is available in Table 7.

Table 7

Learner Support for Students in Web Courses

Support Types	Frequency	Percentage
Class Orientations	25	43.1
Help line	16	27.5
CD Rom	4	6.8
Other	13	22.4

Specific participant responses to question 7 under "other" were as follow: (a) live orientations, (b) open campus, (c) faculty provide technical support, (d) instructor, (e) distance learning Web page, student materials online, (e) email direct to instructor chat room, (f) Web orientation, (g) advisors and mentors, (h) Web resources, (i) student-help Web page, (j) various via Web page, (k) Web tutorial, (l) online tutorials, and (m) distance learning pages and email.

Response to Item 8

Are there incentives for faculty to develop Web courses at your college? If yes, please specify. This question was part of the series designed to identify various types of

institutional support systems as indicators of the level of priority for Web courses (question 1) and support of faculty to develop Web courses (question 4). Overall participant response (66.6%) of yes to this question could indicate some slight discrepancy with question 1 and 4 responses. For example, 77.7% of participants agreed that Web course development was a priority in question 1, and 81.4% agreed that faculty support to develop Web courses was a priority. The incentives for faculty to develop Web courses did not fully measure to the level of priority for Web courses expressed by participants at the colleges. Specified incentives involved monetary stipends, supplements, or staff and program development funds ranging from $300 to $2700. Release time for Web course development was the next common specified response, and a possible lap top computer was indicated in one response. Table 8 provides the orientation distribution data.

Table 8

Faculty Incentives for Developing Web Courses

Orientation	Frequency	Percentage
Yes	18	66.6
No	9	33.3

Specific participant responses for question 8, "if yes, please specify" were as follow: (a) money. (b) $750 - $1500 stipends, (c) supplements, (d) paid 2 times normal amount – 1 dollar amount to develop course, 1 dollar amount to deliver the course (first time only), (e) $500 per course, $1000 for serving as a mentor, (f) staff and program development, (g) dollars, (h) release time, possible laptop, (i) stipends; support; training, (j) small sums ($300 - $400), (l) payment per course developed with approval, (m) stipends for development at $600 per credit hour, (n) released time, (o) some release time in some areas, (p) $2700 upon completion of course, (q) staff and program development, and/or release time, and (r) incentives are same as for other courses, but working on a new plan.

Response to Item 9

Do Web courses require the same curriculum committee approval as live face-to-face instruction based courses? This question was designed to determine the level of support Web courses had with regard to overall curriculum processes and procedures within the college. A high majority of participants (88.8%) indicated that Web courses were approved through institutional processes of curriculum committee approval. Only 7.4% of the respondents indicated that online courses did not require the same curriculum committee approval as live classes. Three respondents similarly noted that delivery systems did not require approval, and that if a course was already approved as a live class, no specific approval was needed. Table 9 provides an overview of these data.

Table 9

Curriculum Committee Approval for Web Courses

Orientation	Frequency	Percentage
Yes	24	88.8
No	2	7.4
No Response	1	3.7

Specific participant responses for question 9 written in the survey margin were as follow: (a) courses require approval, not delivery systems, (b) if course is already offered live face-to-face, no specific approval/review is necessary, (c) at present all distributed courses already exist as live face-to-face, content same and delivery different, and (d) if the web course is a new one.

Response to Item 10

What types of Web course software are available to faculty at your college? This question was part of the series designed to determine types of institutional support for Web course development by providing a variety of necessary software to faculty for course development. The question also revealed WebCT as the more commonly used Web course development software (32.3%) with FrontPage and

Dream Weaver as close second choices, Blackboard and Netscape Composer were close third choices. Data on the types of software associated with Web course development are summarized in Table 10.

Table 10

Web Course Software Available

Software Type	Frequency	Percentage
WebCT	23	32.3
Netscape Composer	8	11.2
Dream Weaver	12	16.9
Adobe GoLive	2	2.8
FrontPage	13	18.3
Blackboard	9	12.6
Other	4	5.6

Specific participant responses for question 10 under "other" were as follow: (a) Prometheus, (b) Corel Draw, (c) Word, and (d) Respondus for test generation.

Response to Item 11

Is there a comprehensive college plan or procedure for faculty who want to teach Web courses at your college? This question was designed to find if established

administrative processes were in place to accommodate faculty and institutional readiness levels within the colleges. The data indicated a considerable split on the question responses with 62.9% dominated by yes and 33.3% responding with no. Six respondents commented with written notes on the margins of the survey noted that plans or procedures are in developmental stages. Data on the comprehensive plans or procedures for Web courses are provided in Table 11.

Table 11

Comprehensive Plan or Procedure for Web Courses

Orientation	Frequency	Percentage
Yes	17	62.9
No	9	33.3
No Response	1	3.7

Specific participant responses for question 11 written in the survey margin were as follow: (a) no response checked, but noted a fledgling plan for online faculty certification, (b) being developed, (c) in progress, (d) college plan, yes, not necessarily comprehensive, (e) in development, (f) in process with distance learning committee, and (g) being written.

Response to Item 12

Which types of students are your Web courses primarily designed for? This question asked for a response regarding which levels of students and degree programs Web courses were targeting at Florida community colleges. A strong response of 33.8% indicated that more Associate of Arts degree students were being served. A rating of 20.9% was given for Associate of Science degree students. Freshman and sophomore level students were served equally at 14.5%. Participant ratings on types of students that Web courses are designed for are provided in Table 12.

Table 12

Types of Students for which Web Courses are Designed

Student Types	Frequency	Percentage
Freshman	9	14.5
Sophomores	9	14.5
A.A. Degree	21	33.8
A.S. Degree	13	20.9
A.A.S.	2	3.2
Certificate	5	8.0
Other	3	4.8

Specific participant responses for question 12 under "other" were as follow: (a) all areas, (b) all, (c) targeted A.S. and certificate, and (d) A.A. general education courses.

Response to Item 13

If your college does not have a plan for developing Web courses what are some of the reasons? This question referred back to number eleven with regard to having a comprehensive plan or procedure for web course. Those participants not responding to this question (52.9%) for lack of a Web course development plan was somewhat consistent with question eleven and the 62.9% response of having a Web course development plan. Reasons for not having a Web course development plan were evenly distributed in four different categories. Lack of student interest was not selected as a reason for lack of a Web course development plan. Other specified responses indicate that Web course development plans were not established due to relative new beginnings in this area of the colleges. Data on reasons for lack of a Web course development plan are summarized in Table 13.

Specific participant responses for question 13 under "other" were as follow: (a) we are new at this, (b) just beginning in Web development process, (c) developing a course is covered, but extra caveats are being added for Web, and (d) also, most courses are already written and may be purchased, leased, etc. We are looking more at editing and tweaking existing courses.

Table 13

Reasons for Lack of a Web Course Development Plan

Variable Label Characteristics	Frequency	Percentage
Lack of financial support	3	8.8
Lack of technical support staff	3	8.8
Lack of faculty interest	3	8.8
Lack of administrative support	3	8.8
Lack of student interest	0	0.0
Lack of hardware/software equipment	1	2.9
Other	3	8.8
No response	18	52.9

Response to Item 14

What percent of full-time faculty teach Web courses at your college per year? Question 14 was designed to determine the level of full-time faculty involvement in teaching Web courses throughout the colleges. Between 10% and 25% of full-time faculty members comprised a combined total of 85.1% who were teaching Web courses per year. A moderate number (11.1%) of respondents indicated that more than 25% of full-time faculty members were teaching Web courses per year. Question 14 links back to item 2 regarding the number of faculty teaching Web courses in fall 2001. Responses

were consistent with question 2 where a combined total of 41.1% of respondents indicated that from one to fifteen faculty members taught Web courses in fall 2001. Information on the number of full-time faculty teaching Web courses per year is provided in Table 14.

Table 14

Full-Time Faculty Teaching Web Courses Per Year

Value Ranges	Responses	Percentage
Less than 10%	11	40.7
10% to 25%	12	44.4
More than 25%	3	11.1
No response	1	3.7

Response to Item 15

Is technical support provided to faculty after a Web course is developed? If yes, what type? This question referred back to item 4 regarding faculty support to develop Web courses as a priority. Question 15 responses were consistent to an extent with 92.5% of respondents indicating that technical support was provided after a Web course was developed. Question 4 respondents showed that 81.4% of colleges had faculty support to develop Web courses as a priority. The response of "no" at 7.4% in question

15 was totally consistent with question 4 response at 7.4% indicating disagreement that faculty support to develop Web course was a priority. A wide range of technical and instructional mechanisms were listed in support for faculty after a Web course was developed. Table 15 contains information on this survey items.

Table 15

Technical Support Provided After Web Course Development

Orientation	Frequency	Percentage
Yes	25	92.5
No	2	7.4

Specific participant responses for question 15 "if yes, what type" were as follow: (a) any support needed, (b) IT support – immediate, help desk, (c) IT support, (d) part-time help desk, (e) both instructional technologists and technicians, (f) upon request through distance learning office or learner support center, (g) distance education department, college training and development department, (h) educational technology specialist through title III grant, (i) multimedia designer, (j) Web CT; HTML, (k) instructional technology support, (l) instructional technologists at each campus, (m) through distance learning office and CTS (instructional support group), (n) software

support/training, curriculum design support, Web design, (o) Web staff in IT department, and (p) through distance learning and institutional technology.

Response to Item 16

Is there a budget for developing Web courses at your college? This question had references back to questions 1, 4, and 8 regarding college priorities, faculty support priorities, and faculty incentives. Question 1 showed 77.7% agreement of Web courses as a college priority; question 4 showed 81.4% agreement of support for Web courses as a priority; and question 8 showed 66.6% faculty incentives for Web courses. Participant responses to this question did not seem to be consistent with question 1, 4, and 8 responses. Only 44.4% of respondents indicated that there was a college budget for developing Web courses. Three specific written responses indicated that funds were reserved but must be applied for, and some funds were available through staff and program development funds. A third response indicated that Web course funding was not a separate item and was funded through the instructional budget. Table 16 provides the data for this question.

Specific participant responses for question 16 written in the survey margin were as follow: (a) funds reserved but must be applied for, (b) there has been staff and program development and release time, (c) not a separate item – part of instructional budget, and (d) there is a budget for developing courses.

Table 16

Budget for Developing Web Courses

Orientation	Colleges	Percentage
Yes	12	44.4
No	13	48.1
No Response	2	7.4

Response to Item 17

What impact has Web course instruction had on your college? This question was designed to identify what, if any, impact Web courses may have had at Florida community colleges. The highest responses of 23.1% and 21.9% were in each of the areas of student satisfaction and increased enrollment. Faculty satisfaction was rated at 19.5% and increased college revenue had a 12.1% rating. Increased operating expenses were rated at 10.9% and the "other" category noted that data was not available to support any cause/effect relations that question 17 suggests. Additional data is available in Table 17.

Specific participant responses for question 17 under "other" were as follow: (a) there is no data to support cause/effect relationship that I am aware of, could only speculate, (b) don't know - specific statistics not available; has increased access for students, and (c) too early to tell some of these answers regarding impact, and they have

increased workload for distance learning and institutional technology, and opened communicating between college departments.

Table 17

Impact of Web Courses

Variable Label Characteristics	Frequency	Percentage
Increased college revenue	10	12.1
Increased operating expense	9	10.9
More classroom space	7	8.5
Faculty satisfaction	16	19.5
Student satisfaction	19	23.1
Increased enrollment	18	21.9
Other	3	3.6

Response to Item 18

Instructional design support for Web course development is available to faculty. This item was included to measure and assess the importance placed on instructional design as an infrastructure support system for faculty as related to Web course development. Participant response indicated that 74% of colleges had instructional design support available to faculty. Two participants responded with written comments

that instructional design centers were just getting started, and one response indicated that an educational technology specialist provided support in this area. Table 18 provides an overview of this area.

Table 18

Instructional Design Support for Web Course Development

Value Labels	Frequency	Percentage
Strongly Agree	8	29.6
Agree	12	44.4
Uncertain	4	14.8
Disagree	2	7.4
Strongly Disagree	1	3.7

Specific participant responses for question 18 written in the survey margin were as follow: (a) instructional design center just started, (b) we have a center for instructional design, but it is just getting started, and (c) somewhat available through educational technology specialist.

Response to Item 19

Does your institution have sufficient hardware to support Web course instruction? This item requested information on whether institutional hardware was adequate to

support Web course delivery. A large majority (92.5%) of respondents indicated that existing hardware was sufficient to support Web course delivery. One participant noted that software was not sufficient and another noted that more bandwidth was needed for video streaming. Data is presented in Table 19 regarding sufficient hardware to support Web course instruction.

Table 19

Sufficient Hardware to Support Web Courses

Orientation	Frequency	Percentage
Yes	25	92.5
No	2	7.4

Specific participant responses for question 19 written in the survey margin were as follow: (a) not software, (b) still need more bandwidth for video streaming, and (c) sufficient – is the key word.

The information in Table 20 provides an overview of the 28 Florida community colleges surveyed in relation to the data collected for this research. The table helps establish a perspective on the Web course development efforts represented by the data collected in comparison to the number of colleges, campus sites, and students served in the Florida system.

Table 20

Rank of Florida Community Colleges by 1999 – 2000 Headcount
(From 2001Florida Community College System Fact Book)

Florida Community College	Number of Sites	1999-2000 Headcount Unduplicated
1. Miami-Dade	11	98,065
2. Florida C. C. at Jacksonville	10	55,221
3. Valencia	6	51,068
4. St. Petersburg	13	48,188
5. Broward	6	45,746
6. Hillsborough	8	44,150
7. Indian River	6	39,299
8. Palm Beach	7	36,193
9. Daytona Beach	6	29,953
10. Brevard	6	25,629
11. Pensacola	6	24,089
12. Seminole	4	21,256
13 Santa Fe	4	20,933
14. Gulf Coast	5	20,872
15. Tallahassee	3	20,506
16. Edison	3	20,449
17. Polk	2	18,341
18. Central Florida	8	16,651
19. Manatee	2	16,214
20. Okaloosa-Walton	5	13,641
21. Pasco-Hernando	6	10,327
22. St. John's River	3	8,285
23. South Florida	6	7,197
24. Lake Sumter	3	6,080
25. Lake City	3	5,667
26. Chipola	1	5,491
27. North Florida	4	4,252
28. Florida Keys	4	3,798

Telephone Interviews with Community College Distance Learning Personnel

Five telephone interviews were conducted with Florida Community College Distance Learning Consortium Member representatives between late November and mid December 2001. Representatives were selected for interviews on the recommendation of other consortium members who viewed those colleges as exemplary leaders in Web course development and delivery. Interview questions were designed to probe further into similar topic areas covered on the survey questionnaire. A series of 24 questions were asked over a period of 45 minutes or less for each interview. Topic areas of Web course related questions included: (a) types of hardware and software used, (b) number of support staff personnel for Web course development and delivery, (c) equipment and facility availability, (d) pre-requisites or processes for faculty using Web course equipment and facilities, (e) types and availability of Web course curriculum and development support, (f) department, position title, and formal processes for administering Web courses, (g) percentage of faculty expressing interest in developing Web courses, (h) consistency with mission and vision of the college, (i) currently needed enhancements for Web courses, (j) meeting student needs for Web courses and technical support, (k) implications of Web course instructional technology and access, (l) academic programs taking lead roles in Web course development and delivery, (m) current status and culture of the college regarding Web course development and delivery, (n) reluctance of colleges to offer Web courses, and (o) history and preparation for Web course delivery and development at the colleges. The five interviews were conducted with a series of

structured questions in an effort to gather more detailed data from a variety of Web course community college environments. The interviews were kept casual and informal in an effort to allow each person to expand and speak freely in providing answers. This method allowed for interviewees to anticipate and answer some of the prepared structured questions in a natural flow throughout the interview and within the context of various questions. Overviews and synopsis of the voluntary and confidential interviews are documented in the following section of this study.

Interview 1

The telephone interview was conducted with an Associate Vice President for Instructional Technology who was also a Florida Community College Distance Learning Consortium Member representative.

What types of hardware and software are used in Web course development and delivery? Web CT on Unix with Eduprise as the main host for fully online courses operating 24 hours per day and seven days per week for student access.

What is the number of support staff personnel for Web course development and support? There are two server support personnel, and three academic support personnel including the Director of Extended Learning.

Are Web course development facilities and support available to both full-time and part-time faculty? Full-time faculty members in the second year of teaching have access to the E-Learning online course and are paid to develop courses. Part-time faculty

members are encouraged to enroll in the E-Learning online course and have access to the host server and support structure.

Are there pre-requisites for faculty using Web course development and delivery support structures? Faculty members are assessed for readiness before they begin developing an online course. They need and obtain Windows knowledge and functioning on the Web with workshops.

What percentage of faculty expresses a desire for access to develop Web courses? Presently there are approximately 100 faculty Web accounts of 300 to 320 total full-time instructors. This equals about 35% of the faculty interested and involved in Web course development and delivery.

Under what departmental area of the college should Web course development and instruction be administered? Because the college is involved with a faculty union this is defined under that work contract. There is a good agreement between the college and faculty that provides an intellectual property and compensation agreement stating that faculty members own the developed Web course.

Is Web course development and instruction consistent with the mission and vision of the college? Yes, Web courses are viewed as a natural extension of lifelong learning.

What is needed to further enhance the Web course development process at your college? There is a need for additional outsourcing of services for Web courses, more instructional design personnel on staff, and more faculty support. The additional faculty

support is needed because Web instructors are assigned two-fifths teaching load to help other faculty teach online courses

What are the implications of this instructional technology and access if it is not made available to both faculty and students? The college would lose market-share of student enrollment to other colleges offering online courses. Online courses give access to students in workforce related programs.

Who is ultimately responsible for all Web course instruction that is developed and delivered at the college? The Associate Vice President for Instructional Technology is the person responsible.

Which Web course technical support needs are most expressed by students at your college? Direct faculty member support.

Which academic programs or courses have taken a lead role in Web course development and delivery? The health sciences area has been a leader in Web courses.

Which academic departments have been involved with the process of Web course development? The social sciences, English, mathematics, the Associate of Art program, and the Associate in Science aviation pilot technology program.

How has Web course development and delivery of instruction occurred at the college? It has been conservative but increasingly opened up. There have been 35 fully online courses developed within three years.

What is the history of Web course development and offerings are the college? The current Associate Vice President for Instructional Technology has been the catalyst by

providing 21st century teaching technology to an active faculty with staff and program development budget support.

Interview 2

The telephone interview was conducted with a Provost who was also a Florida Community College Distance Learning Consortium Member representative.

What types of hardware and software are used in Web course development and delivery? Web CT and Publishers software are used.

What is the number of support staff personnel for Web course development and support? There is a Media services department at each of four campuses with three people in each department responsible for instructional design, video streaming, and V-Tel. Student assistants design Web pages. The college provost serves as the Florida community college distance-learning consortium member who devotes 50% of work time coordinating those support personnel efforts.

Are Web course development facilities and support available to both full-time and part-time faculty? Both full and part-time faculty members create Web courses with minimal support from the college.

Are there pre-requisites for faculty using Web course development and delivery support structures? There are no pre-requisites for any course to go online which already exists as a live face-to-face course at the college.

Is there a formal college process or procedure for developing Web courses at the college? The college process for faculty is individual, gradual, and developmental for online courses and occurs over three semesters.

What department of the college administers Web courses? Academic affairs.

What is the process for providing faculty access to Web course software and hardware? Is this a formal college process or procedure? The process is one of no barriers and is loose and informal. Not more than one course has begun as a fully online section.

What percentage of faculty expresses a desire for access to develop Web courses? Presently 10% of the total college full-time faculty are involved in distance learning and 40 totally online courses are being taught. At the south campus one third of the faculty teach online courses. There are approximately 6000 students, 35 full-time, and 140 part-time faculty members. The college has an automatic process for generating a Web page for faculty and every full-time faculty will have a Web page. Currently 80% of all part-time faculty members have at least a course syllabus online, the college goal is to have 100% of syllabi online.

Is Web course development and instruction consistent with the mission and vision of the college? Yes, the college goal is distance learning and how it affects student success. There is no significant difference in grades; it provides access to many students who would not be able to attend live face-to-face college courses. Eighty percent of their students enroll in a distance-learning course, 20% never step on the campus.

What is needed to further enhance the Web course development process at your college? There is a need for increased bandwidth of server lines to provide video streaming capabilities for college standardized three to four minute faculty online course video introductions.

What should be included in Web course development support for both faculty and students? There is a need for help-desk line for students; technicians for faculty; a formal media program or Web development course; and a dedicated budget for faculty to attend conferences – not just as an add-on.

What are the implications of this instructional technology and access if it is not made available to both faculty and students? The college either offers online courses or someone else will do it. Florida Atlantic University is not doing much, but Nova or Phoenix would offer the courses as part of their global distance education concept.

Who is ultimately responsible for all Web course instruction that is developed and delivered at the college? The college Provost, as much of the online course success is due to being on the Presidents staff and being an active supporter of distance learning in all areas of college operations.

Does the college support system and staff meet Web course technical support needs most expressed by students? The college is sufficiently managing through committed funds within operational divisions.

Which academic programs or courses have taken a lead role in Web course development and delivery? The science area has been a leader in developing and offering

Web courses in anatomy and physiology, biology, chemistry, astronomy, and all courses in physical science.

Which other academic departments have been involved with the process of Web course development? The computer science area has one or two full-time faculty and some part-time faculty involved. The education area would rank fourth, and mathematics ranks fifth. The speech area would rank last in Web course development and delivery.

What is the culture of the college regarding Web course development and delivery? The culture of Web course development and delivery is well received. Testing is an issue in getting exams distributed for live student access at each campus.

How has Web course development and delivery of instruction occurred at the college? It began three years ago when college administrative personnel began to ask if the college was prepared to meet the future needs of elementary, middle school, and high school students and scholars who have high levels of computerized educational experience prior to attending community college.

Interview 3

The telephone interview was conducted with a Vice President of Academic Affairs who was also a Florida Community College Distance Learning Consortium Member representative.

What types of hardware or software are used in Web course development and delivery? Web CT and Dream Weaver software are used.

What is the number of support staff personnel for Web course development and support? There are 6 support personnel.

Are Web course development facilities and support available to both full-time and part-time faculty and are there pre-requisites for faculty using Web course development and delivery support structures? All faculty members are given approval for facility use after attending specified pre-training and a course.

What does Web course curriculum and development support include? Technical support is provided for students and instructors.

What is the process for providing faculty access to Web course software and hardware? Faculty members receive required training for both live and online courses.

What percentage of faculty expresses a desire for access to develop Web courses? Approximately 25% of faculty members have done Web course development and delivery.

Under what departmental area of the college should Web course development and instruction be administered? The instructional vice president should give instructional approval and distance-learning support should be involved in the development.

Is Web course development and instruction consistent with the mission and vision of the college? Yes.

What is needed to further enhance the Web course development process at your college? There is a need for support personnel to sit and work with faculty.

What should be included in Web course development support for both faculty and students? There is a need for qualified personnel in theory of instructional design and hardware.

What are the implications of this instructional technology and access if it is not made available to both faculty and students? The implications would be bad as instructional technology access is a necessity.

Who is ultimately responsible for all Web course instruction that is developed and taught at the college? The Vice President of Academic Affairs is ultimately responsible.

Which Web course technical support needs are most expressed by students at your college and are those needs met? Yes, the college does a good job in this area as it is an Internet access provider and students receive free service.

Which academic programs or courses have taken a lead role in Web course development and delivery? The arts and sciences, library science, and criminal justice areas have taken a lead in Web courses.

What is the culture of the college regarding Web course development and delivery? Web courses have been accepted and integrated as another method of instructional delivery and student access.

What forms of Web course support are available to students? Students enrolled in online courses receive free Internet access service, a help desk phone number, and email help.

Is there any reluctance of your college to offer Web courses? Yes, by those who believe faculty lectures are perfect instructional modes.

Which academic departments have been involved with the process of Web course development? The social sciences, English, mathematics, the Associate of Art program, and the Associate in Science aviation pilot technology program.

How has Web course development and delivery of instruction occurred at the college? It began four or five years ago with one computer and an individual English faculty member on own time and with own equipment and one Web person.

What is the history of Web course development and offerings are the college? The college was proud of having developed and delivered the online course and to do others the area would need to be strengthened.

Interview 4

The telephone interview was conducted with a Director of TV Production and Distance Learning who was also a Florida Community College Distance Learning Consortium Member representative.

What types of hardware or software are used in Web course development and delivery? Web CT and Blackboard software are used.

What is the number of support staff personnel for Web course development and support? There are five or six full and part-time support personnel with Web course responsibilities in addition to other assigned duties, but none are dedicated full time to Web courses. Guidelines are being developed and are still in process.

Are Web course development facilities and support available to both full-time and part-time faculty and are there pre-requisites for faculty using Web course development and delivery support structures? All faculty members are given access to the teaching and learning center staff. There are classes offered in Web CT and Blackboard software as preferred pre-requisites to developing online courses.

What does Web course curriculum and development support include? There is a distance learning support services office under supervision of the open campus that supports telecourses. Distance learning had been centralized but now each of five campuses has its own support system, which is sensitive and political.

What is the process for providing faculty access to Web course software and hardware? The open campus personnel oversee all distance learning operations of the college. There is a formal process involving a mentor and stipend for certain courses to be developed for online delivery. If faculty members utilize the formal college process the college owns the completed course. Faculty members can develop courses on their own time and equipment to retain course ownership.

What percentage of faculty expresses a desire for access to develop Web courses? Approximately 25% of faculty members have enrolled in Web CT classes.

Under what departmental area of the college should Web course development and instruction be administered? The vice president of academic services should be the centralized position for administering online course development and instruction, not the open campus area.

Is Web course development and instruction consistent with the mission and vision of the college? Yes.

What is needed to further enhance the Web course development process at your college? There is a distinct need for a dedicated and centralized administrative office and position with full ownership responsibilities for Web courses.

What should be included in Web course development support for both faculty and students? There is a need for a faculty instructional design team approach including technology training with a curriculum component. For students a help desk and learner support system is needed including full-time tutoring services.

What are the implications of this instructional technology and access if it is not made available to both faculty and students? The implications would be a distinct loss of student enrollment as online courses usually fill up first at the college.

Who is ultimately responsible for all Web course instruction that is developed and taught at the college? The Vice President of Academic Affairs is ultimately responsible.

Which Web course technical support needs are most expressed by students at your college and are those needs met? Students seek technical help for online courses. There should be some form of pre-requisite access for students before enrolling in Web courses

to prevent technology mismatches of course requirements and student capabilities. The present support system and staff does not meet those needs but the college is working on it through consolidation of learner support functions.

Which academic programs or courses have taken a lead role in Web course development and delivery? Institutional technology, and office systems technology Associate of Science degree programs have taken lead roles in Web courses. The first online course offered at the college was in sociology.

What is the culture of the college regarding Web course development and delivery? Web courses have been well accepted.

How has Web course development and delivery of instruction occurred at the college? Originally, instructors began developing courses on their own initiative, then a program was developed to support faculty through the teaching and learning center staff with the Navy Partners program. The process was then systematized to include offering degrees online and the formation of the distance-learning futures group that oversees all campuses.

Interview 5

The telephone interview was conducted with a Provost who was also a Florida Community College Distance Learning Consortium Member representative.

What types of hardware or software are used in Web course development and delivery? Web CT software and Del computers are used in open access laboratory environments.

What is the number of support staff personnel for Web course development and support? There are different support personnel. The total center employs 4 full-time technical design specialists for graphics, and there are 6 instructional technologists.

Are Web course development facilities and support available to both full-time and part-time faculty and are there pre-requisites for faculty using Web course development and delivery support structures? All faculty members are given access to support personnel and facilities. There are no pre-requisites for traditional course design and delivery. There is a formal selection process between what online courses are needed and what faculty would like to develop and teach.

What does Web course curriculum and development support include? There is a 32 hour course for faculty members on e-learning journey and is taught by institutional technology personnel. Online courses are presented to flexible access committee comprised of academic discipline faculty and online faculty. Curriculum committee approval is not needed.

What is the process for providing faculty access to Web course software and hardware? Faculty members have access to a help desk and continued support. Faculty members are provided a lap top computer and reduced office hours. Formal policies are established through a grant funded Web site accessible to faculty. There is a faculty

mentor program as part of the support process where experienced Web course faculty members work directly with other faculty in training for Web course development and delivery.

What percentage of faculty expresses a desire for access to develop Web courses? Approximately 25% of faculty members express interest in Web course development and delivery.

Under what departmental area of the college should Web course development and instruction be administered? The e-campus is responsible for operational processes and instructional technology is responsible for online course developmental pedagogy and the e-learning journey program.

Is Web course development and instruction consistent with the mission and vision of the college? Yes.

What is needed to further enhance the Web course development process at your college? There is a need for more faculty members interested in Web course development and instruction as enrollment is up 45% with full online classes. There is a distinct need for more online course sections.

What should be included in Web course development support for both faculty and students? Nothing, the college received a big grant and is well staffed. The weak link would be in the streaming video area where there is a need for hardware, software, and personnel support.

How can Web course technology best meet the needs of your students? It provides flexible learning that can occur at any place, anytime, and at any path. A good feature is that there is more and high quality student interaction in online courses.

What are the implications of this instructional technology and access if it is not made available to both faculty and students? The implications would be that faculty would complain since some e-faculty teach fifteen hours of online courses for a full instructional contract. Many students would probably not enroll for as many courses at the college since demographics indicate that 80% of them work.

Who is ultimately responsible for all Web course instruction that is developed and taught at the college? Technically the college District Board of Trustees are responsible, but realistically on a day-to-day operational basis, the program director of e-campus is responsible.

Which Web course technical support needs are most expressed by students at your college and are those needs met? Yes, the college provides project eagle for key online services to students including help desk, tutorials, with base-line computer skills attachment and skill-based modules. There is a model course designed in Web CT for students to sample with course templates, faculty templates, and Web pages with video streaming.

Which academic programs or courses have taken a lead role in Web course development and delivery? All areas have taken a lead role with online courses except

for speech. The veterinary technician program was the first to be offered as fully online, and communications faculty had the first online course in 1993.

What is the culture of the college regarding Web course development and delivery? Web courses fit the culture of the college administratively but there is some nervousness about what it all means for more traditionally oriented faculty.

What is the total number of faculty at the college who teach either fully online, partially online, or media enhanced courses? Twenty five percent teach an online course of some degree.

Is there any reluctance of your college to offer Web courses? Yes, parts of the campus express some nervousness regarding micro policy issues. There are questions about the amount of time that online faculty should respond to students – should it be 24 hours per day and seven days per week, or 24 hours per day and five days per week? Is this an infringement of academic freedom issue, in addition to tensions about office hours, and course overloads?

How has Web course development and delivery of instruction occurred at the college? Centralization was an important issue with e-campus as a single and central point of contact for online course development, support and delivery. The cyber-advisor was key for student support and as promotional for online courses.

What is the history of Web course development and offerings are the college? The college overall has a good feeling about Web courses and are in the process of formulating evaluation and retention methods.

Summary of Telephone Interviews

The five telephone interviewees were member representatives of the Florida Distance Learning Consortium. Two of the interviewees were campus provosts, two were vice presidents in the academic areas of institutions, and one was the director of distance learning. Each was responsible for all Web course instruction that was developed and taught at their institutions. They definitively agreed that Web course development was consistent with the mission and vision of their colleges, and that online courses provided increased access for students in achieving lifelong learning.

Each of the five interviewees indicated Web-CT as the dominant software for distance learning with supplemental software also used. The number of support staff personnel ranges from five on one campus to as many as twelve on a total of four campuses. Some support positions are split between technical and academic areas with dominant duties and responsibilities on instructional design and Web courses. All of the interviewees had a difficult time identifying the exact number of support staff personnel for Web course development because some were technically oriented and some were academically oriented.

At each of the five colleges, both full and part-time faculty members were provided access to Web course support facilities and personnel. Four of the five institutions had pre-requisites implemented for faculty members prior to developing Web courses.

Three of the five colleges had approximately 25% of the faculty expressing an interest in developing online courses. One college had 10% and another had 35% of its faculty developing and teaching online courses.

Four of the five interviewees believed that the academic and educational areas of the colleges should administer Web courses. At one of the colleges this decision was determined by a union contract agreement that placed online courses under the intellectual property and compensation area.

The needs for further enhancement of Web course development are clear and point to a need for expanded organizational capabilities in the forms of increased support, faculty, administrative centralization, and equipment capabilities. All of the interviewees recognized the negative implications if this instructional technology were not made available to faculty and students including the loss of student access and enrollment to other colleges.

All of the interviewees indicated a strong acceptance and integration of the Web courses into the culture of the colleges with some concerns in the area of testing and what the implications are for more traditionally oriented faculty. The occurrence of Web courses at each of the five-interviewee colleges was because of individualized movements by pioneer faculty in a variety of academic disciplines that became independently interested in the concept and developed initial online courses. Gradually, the formalized administrative and developmental processes, commitments, and funding have tried to organize and formalize the approaches.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

Research for this study included population survey data collection, accessing public information, review of literature in the field, and personal interview techniques to determine levels of involvement in the development and delivery of online courses throughout the Florida community college system. This research included factors of institutional support provided by system infrastructures established within individual institutions. Additional focus was placed on the types of online course development and delivery support systems for faculty and students. Methodology was planned in question design and sequencing in the following areas of inquiry:

1. Is Web course development a priority at the community colleges?
2. How many faculty members taught Web courses at the community colleges during fall 2001?
3. Which academic areas offer Web courses in Florida community colleges?
4. Is support of faculty members to develop Web courses a priority at Florida community colleges?
5. How many years have Florida community colleges been involved in Web course development?

6. Which areas of Florida community colleges are responsible for Web course technical support of faculty?
7. What learner support systems are available for students enrolled in Web courses at Florida community colleges?
8. Are there incentives for faculty to develop Web courses in Florida community colleges? If so, what types?
9. Do Web courses require the same curriculum committee approval as live face-to-face instruction based courses?
10. What types of Web course software are available to faculty at Florida community colleges?
11. Is there a comprehensive college plan or procedure for faculty who want to teach Web courses at Florida community colleges?
12. Which types of students are Florida community college Web courses designed for?
13. If a Florida community college does not have a plan for developing Web courses what are some of the reasons?
14. What percent of full-time faculty teach Web courses in Florida community colleges per year?
15. Is technical support provided to faculty after a Web course is developed? If yes, what type?
16. Is there a budget for developing Web courses at Florida community colleges?

17. What impact has Web course instruction had on Florida community colleges?

18. Is instructional design support for Web course development available to faculty?

19. Do Florida community colleges have sufficient hardware to support Web course instruction?

Through the above question methodology the following large questions of the research study were addressed:

1. What incentives and rewards are there to motivate faculty in obtaining knowledge to develop and teach online courses?
2. What academic services and technical support are available to students enrolled in online courses?
3. What processes, procedures, instructional design, and technical support are there for faculty to develop and teach an online courses?
4. What software, equipment, and facilities are being used for the development and delivery of online courses?
5. What levels and degrees of online course development exist in Florida community colleges in relation to the size of the institutions?

Findings of Research Question 1

What incentives and rewards are there to motivate faculty in obtaining knowledge to develop and teach online courses? Various incentives and rewards were identified at eighteen or 66.6% of the 28 Florida community colleges in helping motivate faculty

obtain knowledge for developing and teaching online courses. The most common incentives and rewards for faculty involved specified monetary stipends, additional pay supplements, and program development funding, all ranging from $300 to $2700 in extra pay earnings. Released time from instructional loads for Web course development was the next common specified incentive and reward response. The issuance of a laptop computer was identified as one possible incentive.

The results of this answer indicate that a majority of Florida community colleges prioritize and value faculty development of online courses within the culture of the institution and are willing to support those faculty efforts through a range of incentives from monetary to release time to laptop computer issuance.

Findings of Research Question 2

What academic services and technical support are available to students enrolled in online courses? Participant response concerning academic services and technical support available for online students included Web class orientations conducted live; access to help lines; course-specific Web pages; online tutorials for managing Web courses; instructor email contact for technical support; and easy access to online advisors and mentors.

The results of this answer indicate that Florida community college personnel are interested in and concerned about online student learner support both academically and technically at those institutions offering Web course instruction.

Findings of Research Question 3

What process, procedures, instructional design, and technical support are there for faculty to develop and teach online courses? First, it should be noted that no institutional limits, blocks, or restrictions were identified at any institution in this study that would prevent any individual faculty member, or those in any particular academic discipline from developing Web courses. Support of faculty to develop Web courses was identified as a priority at 22 or 81.4 % of the community colleges, which closely matched the prioritizing of Web courses at 21 or 77.7% of the colleges. Similarly, 24 community colleges had adapted existing traditional curriculum committee approval processes to include Web courses.

Seventeen community colleges (62.9%) indicated that there was a comprehensive plan or procedure for faculty who want to teach Web courses. Although some colleges indicated that plans were being established, there were administrative processes in place to accommodate faculty and institutional readiness levels within the institutions.

The administrative structures for supporting faculty to teach Web courses were oriented dominantly under the academic departments of eighteen institutions as opposed to ten placed under institutional technology divisions. Technical support is provided to faculty in a wide variety of forms after a web course is developed at 25 of the community colleges indicating that a large majority (92.5%) are committed to faculty online efforts. Instructional design support for Web course development was available for faculty at 74% of the community colleges.

The cumulative effects of the support processes, procedures, and instructional design, and technical support developments identified in this study would seem to indicate a cultural acceptance and institutional readiness of Web courses.

Findings of Research Question 4

What software, equipment, and facilities are being used for the development and delivery of online courses? Survey results indicate that a variety of necessary software were institutionally provided to faculty for Web course development. A majority of 23 institutions provided Web CT software to faculty. FrontPage software was available at thirteen colleges, Dream Weaver at twelve colleges, Blackboard and Netscape Composer were available at nine and eight institutions respectively. Twenty-five college (92.5%) participant responses indicated that college hardware was sufficient to support Web course instruction.

A wide variety of institutional facilities were used for the development and delivery of online courses and were identified as follow: (a) extended learning, (b) media services departments, (c) teaching and learning centers, (d) help desks, (e) technical departments and support staff personnel, (f) academic technology, (g) streaming video equipment, (h) instructional technology and design center, (i) institutional technology, (j) grant resources and funds, (k) staff and program development funds, (l) educational technology specialist, (m) distance learning, (n) academic computing, and (o) management information systems.

Findings of Research Question 5

What levels and degrees of online course development exist in Florida community colleges in relation to the size of the institutions? Participant responses to the basic question of whether Web course development was a priority was uncertain or disagreed upon by five of six colleges that were in the smallest one-third of the total group listed in Table 20. Along that same line, four colleges in the smallest one-third group of Table 20 had only one to five faculty teaching Web courses. Ten colleges with more than 25 faculty teaching Web courses were among the top fourteen in Table 20. Eight of those ten colleges with more than 25 faculty teaching Web courses were among the top third largest in Table 20.

Four of the larger colleges in the top third of Table 20 have been involved in developing Web courses for six to eight or more years.

Three colleges in the lowest one-fifth of Table 20 indicated lack of financial support as a reason for not having a Web course development plan. One of the smallest community colleges indicated a lack of hardware or software as a reason for not having a Web course development plan. Two colleges from the smallest one-third group of Table 20 indicated insufficient hardware to support Web courses.

Of three colleges with more than 25% of full-time faculty teaching Web courses per year, two were in the upper one-half of Table 20, and one was in the lower one-third of Table 20.

Research in this area of the study indicated that Florida community colleges with lower enrollment had proportionally lower numbers of faculty teaching Web courses. Higher enrolled colleges had proportionally higher numbers of faculty teaching Web courses. The higher enrolled colleges have also been developing Web courses for a longer period of time, and generally seem better equipped in finances and staffing to make Web course development a priority; to have Web course development plans; and to offer and support more Web courses than lower enrolled colleges.

Conclusions

A primary intent of this study was to provide data and research relating to Web course design and delivery throughout the Florida community college system. Although the concept for distance education is not new, the Web as a vehicle for online course instructional delivery is relatively new. By combining computer technology with the instructional process, the nature of education is being transformed through how it is delivered and received. This educational paradigm shift suggests a need for a change in the way instructors are supported both pedagogically and technically.

In this study it was identified that Florida community colleges were involved in Web course design and delivery at varying levels and degrees throughout Florida based on financial capabilities, qualification levels of available support staff, and institutional readiness factors of faculty and administrative interest and action, and overall academic cultural climate. Some colleges recognized and responded to societal and student needs

for online courses at an early stage of development and institutionalization of processes and procedures that comprised comprehensive system infrastructure needs for instructional effectiveness. Although the degrees of development and delivery of online courses varied throughout the state, the need for online course accessibility to students does not vary.

There is no clearly developed or recognized system or process established for implementing, administering, or supporting online courses institutionally. Each college, as determined by interest, size, support capabilities, funding levels, and readiness factors has moved forward in meeting system infrastructure needs for online courses. The need for meeting the Web course educational paradigm shift has been recognized by most Florida community colleges, and they have responded to the challenge in some small or large ways.

This research attempted to provide a rationale for the implementation of system infrastructures for online courses to be included in the community college curriculum. Instructional technology is changing the way society educates and there is a need to recognize the value of, and need for, providing educators and students access to online technology processes and instruction.

Some educators and students may not grasp these educational changes easily and might stay with traditional delivery methods of teaching and learning because they feel comfortable. Traditional methods also feel safe because they do not involve change. It will be important for institutions, educators, and students to determine whether safe, or

changed, educational forms are equally effective and beneficial. If the initial motivating concepts of community colleges were cost, convenience, and accessibility, then online courses would seem to be in line with those visions and missions. Online courses are also certainly in line with the lifelong learning concept of education.

Florida community colleges will need to become motivators and facilitators for online courses or other institutions will develop the educational products to meet the needs of present day society and students. Faculty will also need to become interested and active in this process, as the possibility for online course outsourcing exists.

Unfortunately, it appears that educational institutions can't afford not to get involved in Web course development and delivery. While the distance-learning concept is not new to education, there has never been a distance-learning delivery method as open, flexible, interactive, spontaneous, dimensional, accessible, responsive, and as fast as this present day technologic system. Online learning will be a viable alternative to current educational delivery methods.

Data analysis indicated that a majority of Florida community colleges (21) established Web course development as an institutional priority. The commitment to develop Web courses is substantiated by the equally high number of participant responses (22) indicating that faculty support for developing Web courses is a priority. The commitment toward Web course development as a priority is rather consistent with eighteen college participant responses indicating incentives for faculty to develop Web

courses, and twelve community colleges with budgets established specifically for developing Web courses.

A large majority of Florida community colleges not only provided incentives for faculty to move toward Web course development but data also indicated that 25 community colleges provided a diverse range of technical support to faculty after a Web course was developed. Data substantiated this area of the study with twenty community college survey participants who agreed that instructional design support was provided for faculty to develop Web courses.

Further data analysis indicated that a minimum of 417 faculty members taught either partially or fully online courses in the fall 2001 semester. The maximum number of faculty members teaching online community college courses was 485 and upward throughout Florida. A mid range of faculty teaching online courses in fall 2001 was 451. The interest levels of teaching Web courses was spread throughout twenty three Florida community colleges where up to 25% of full-time faculty members taught Web courses. Three colleges had more that 25% of full-time faculty teaching Web courses. Faculty members may have felt comfortable in moving toward the direction of Web course development as seventeen Florida community colleges had comprehensive plans or procedures for faculty members who wanted to teach Web courses. Similarly, data analysis indicated that 25 community colleges provided a diverse range of technical support to faculty after a Web course was developed.

A majority of community colleges (18 to 21) offered Web courses in the academic areas of humanities and fine arts, behavioral and social sciences, natural and physical sciences, business, and English and communications. Slightly lesser numbers of community colleges (10 to 16) offered Web courses in the academic areas of education and physical education, mathematics, nursing, criminal justice, and accounting. Thirteen community colleges offered Web courses in the areas of computer science and networking, nutrition, medical fields, legal assisting, dental, veterinary technician, emergency management, Spanish, and a complete Associate of Arts degree.

A majority of community colleges (21) were designing Web courses primarily for Associate of Arts degree students, while considerably fewer colleges (13) designed Web courses for Associate of Science degree students. Five colleges had Web courses designed for certificate program students, and two colleges designed Web courses for Associate of Applied Science degree students.

A majority of community colleges (25) had class orientation support systems for students enrolling in Web courses, while sixteen colleges had help line learner support for Web students. Thirteen college participant responses indicated other forms of learner support through open campus; faculty provided technical assistance; Web pages for distance learning help, tutorials, course resources, and materials; email, advisors, and mentors.

The area of Web instructional delivery was relatively new to the Florida community college system as evidenced with only one community college involved with

Web course development for more than eight years. Five colleges had been involved for one to two years, and 21 colleges had been involved for three years.

Some software consistency was established with 23 colleges settled on Web CT as the Web course development software, with Front Page, Dream Weaver, Black Board, and Netscape Composer following in order. Related to the software issue, data analysis indicated that 25 community colleges had sufficient hardware for supporting Web course instruction.

A few colleges indicate a lack of financial support, lack of technical support staff, lack of faculty interest, lack of administrative support, lack of hardware or software, or just beginning involvement as reasons for not having a plan for developing Web courses.

There was rather wide variation on which college areas seemed best considered institutionally responsible for Web course technical support. Thirteen community colleges assigned responsibility to the distance learning area, ten assigned responsibilities to institutional technology, three assigned responsibilities to teaching and learning centers, and eight assigned to other areas noted as instructional technology, academic computing, management information systems, and academic technology. One participant indicated that institutional technology and distance learning areas worked together in being responsible for technical support of faculty members.

Twenty-four community colleges required the same curriculum committee approval for Web courses as live face-to-face instruction based courses indicating that

existing processes and functions are being utilized to encompass new course delivery systems.

Web course instruction has had a variety of recognized impacts on Florida community colleges. Eighteen colleges reported impacts of increased enrollment, and nineteen reported student satisfaction, while sixteen colleges reported an impact of faculty satisfaction. Ten colleges reported increased college revenue, while nine reported an increase in operating expenses. Seven reported an impact of more classroom space. Two participants reported that impact information is not available to support specific cause and effect relationships, but that course access has increased for students.

Detailed responses are included with survey question tabulations in Tables 1 through 19 of Chapter IV.

Recommendations for Further Research

Based on findings of this study, Florida community colleges are developing, implementing, and supporting online courses for the following reasons:

1. student interest in enrolling
2. increased access and convenience for students
3. interest of faculty members to develop and offer online courses
4. hardware and software technology are available on most campuses
5. technical support personnel are available on most campuses
6. increased student enrollment and college revenue

7. opens more classroom space on campuses
8. if a particular community college doesn't offer the courses, another one will

The following recommendations appear to be consistent with the research, communication, limitations, and conclusions at this relatively early stage of online course development in Florida community colleges.

1. This study presents a comprehensive overview of information from 26 Florida community college distance-learning respondents of 28 possible in the system who are actively involved with online course development, delivery, and support. It is clear from this research that Florida community colleges are in the very early stages of establishing and providing system infrastructures for Web course delivery, development, and support for both faculty and students. Follow-up research should involve what system infrastructure commonalities are found and involved in successful Web course delivery in Florida and in comparison to other state community college systems.
2. Data provided by this study indicated that some Florida community colleges were having difficulties in overcoming obstacles associated with establishing Web course development processes or procedures. This would indicate a need for research that addresses the specialized experience and education needed for administering and supporting online course development and delivery needs associated with system infrastructure. This could involve identifying

minimal key support positions, education levels, and related experience to efficiently and effectively develop and offer online courses.

3. This study also provided data from some respondents identifying reasons for lack of a web course development plan. Data collection revealed some minor problems ranging from budget limitations affecting various areas, to lack of administrative and technical support, and faculty interest. Additional research and investigation on these areas could focus on issues beyond budget limitations that address faculty and administrative attitudes towards this education technology and delivery system.
4. A related area to this research involves the assessment of student success levels and the learning effectiveness achieved by online courses. Data collected clearly indicated that student interest and enrollment in Web courses was relatively high. A follow-up study could examine a comparison between online student success levels with live face-to-face instruction.
5. Through this research, instructional design was identified as a component of Web course development support for faculty members. A logical next step in this area of instruction would involve a study of the differences in pedagogy of live face-to-face instruction compare to Web course instruction.
6. One area not explored in this study was the focus on student support for online courses as a part of Florida community college system infrastructure. The research could include student orientation, registration, advising, library

resource access, technical support, and adequacy of overall Web student services and learner support provided.

7. Data collected in this research involved full-time faculty and no differentiation between partially and fully online courses being taught. A follow-up study could further examine the number of part-time faculty involved and supported, as well as, the variations and distinctions of fully or partially online courses.
8. Lastly, a logical follow-up investigation could address the areas and colleges researched in this study through tracking over a period of two years to review the status, measure changes and effectiveness of what may have occurred.

APPENDIXES

APPENDIX A

LETTER OF INTRODUCTION FOR SURVEY INSTRUMENT WITH INFORMED CONSENT PROTOCOL

Dear Colleague,

My name is Glenn Ricci, Dean of Arts and Sciences at Lake Sumter Community College, and I am a doctoral student working under the supervision of Dr. Thomas Kubala, professor of higher education at the University of Central Florida. We are interested in gathering information on Web course development, support, and instruction in Florida Community Colleges and request your help. We would appreciate your assistance in taking a few minutes to answer questions on the enclosed brief survey. It is believed that the survey asks important, useful questions, the answers to which may help improve future Web course delivery and education.

If you cannot accurately provide an answer or do not feel confident about a question, please leave that question blank rather than give erroneous information. There are no known risks and participation is voluntary. Responses to questions about your identity are strictly for possible follow-up purposes and will remain confidential.

You are free to withdraw your consent and to discontinue participation in the project at any time without consequence. The results of this survey will be published in the final dissertation scheduled for completion in May 2002. There are no direct benefits or compensation to participants.

If you have any questions about this research, please contact me at (352) 365-3537 or my faculty supervisor, Dr. Thomas Kubala, at (407) 823-2007. Questions or concerns about research participant's rights may be directed to the UCFIRB Office, University of Central Florida Office of Research, Orlando Tech Center, 12443 Research Parkway, Suite 207, Orlando, FL 32826. The phone number is (407) 823-2901.

We realize this survey will take fifteen or twenty minutes of your valuable time, but the result should be worth the effort. Enclosed please find postage paid, addressed envelope in which to return the survey. To be useful, your response must be received by November 20, 2001. Thank you for your kind consideration.

Sincerely,
Glenn Ricci

I have read the procedure described above and I agree to voluntarily participate in the procedure. Participant name (please print) _____
Participant signature _____ Date _____
Name of college where employed _____
Please check one: _____I would like to receive a copy of the procedure described above.
_____ I would not like to receive a copy of the procedure described above.

IRB COMMITTEE APPROVAL FORM
FOR UCF/OOR/IRB USE ONLY

PI(s) Name: Glenn Ricci
Title: System Infrastructure Needs for Web Course Delivery: A Survey of Online Courses in Florida Community Colleges.

Check as applicable:

[ ]Yes [ ]No [ ]N/A — Have sufficient assurances been given to the committee to establish that the potential value of this research exceeds the risks involved?

[ ]Yes [ ]No [ ]N/A — Written and oral presentations must be given to participating subjects (parents or guardians, if minors) informing them of the protocol, possible risks involved, the value of the research, and the right to withdraw at any time. Has such a statement been prepared? Was it attached to the "Assurance" form?

[ ]Yes [ ]No [ ]N/A — A signed written consent must be obtained for each human subject participant. Has such a form been prepared? Was it attached to the "Assurance" form?

[ ]Yes [ ]No [ ]N/A — Are cooperating institutions involved? If yes, was there a sheet attached to the "Assurance" form providing the name of the institutions, the number and status of participants, name of the involved official of the institution, telephone, and other pertinent information.

Date of Review by Institutional Review Board (IRB) for Human Subjects: _____

Committee Members:

Dr. Theodore Angelopoulos: _____
Ms. Sandra Browdy: _____
Dr. Jacqui Byers: _____
Dr. Ratna Chakrabarti: _____
Dr. Robert Kennedy: _____
Dr. Gene Lee: _____
Ms. Mary Beth Liberto: _____
Ms. Gail McKinney: _____
Dr. Debra Reinhart: _____
Dr. Valerie Sims: _____

[ ] Contingent Approval
Dated: _____

[ ] Final Approval
Dated: _____

[ ] Expedited
Dated: _____

[X] Exempt
Dated: 11-20-01

Chair, IRB
Signed: Glenn Cunningham
Dr. Glenn Cunningham

Addendum to OSR-21/IRB

Revised 04/24/01

APPENDIX B

SURVEY INSTRUMENT

Web Course Delivery in Florida Community Colleges - Fall 2001

Please check the appropriate response to the following questions. You do not have to answer any question you do not wish to answer. All answers will be kept anonymous.

1. Web course development is a priority at your college.
____ STRONGLY AGREE
____ AGREE
____ UNCERTAIN
____ DISAGREE
____ STRONGLY DISAGREE

2. How many faculty members taught Web courses (either partially or fully online) at your college during fall 2001 semester?
___ 1 – 5 ___ 11 – 15 ___ 21 – 25 ___ 6 – 10 ___ 16 – 20 ___ more than 25

3. Which academic areas offer Web courses at your college? Please check all that apply.
____ Humanities/Fine Art ____ Mathematics _____ Education/Physical Education
____ English/Communication ____ Behavioral/Social Science ____ Accounting
____ Natural/Physical Science ____ Business ____ Nursing ____ Criminal Justice
____ other (please specify:_____)

4. Support of faculty to develop Web courses is a priority at your college?
____ STRONGLY AGREE
____ AGREE
____ UNCERTAIN
____ DISAGREE
____ STRONGLY DISAGREE

5. How long has your college been involved in Web course development?
____ 1 – 2 yrs. ____ 3 – 5 yrs. ____ 6 – 7 yrs. ____ 8 or more years

6. Which area of your college is responsible for Web course technical support of faculty?
____ teaching & learning center _____ distance learning
____ institutional technology _____ other (please specify: _____)

7. What learner support systems are available for students enrolled in Web courses at your college? ____ class orientations ____ help line ____ cd-rom
____ other (please specify: _____)

8. Are there incentives for faculty to develop Web courses at your college?
____ yes ____ no If yes, please specify:_____

9. Do Web courses require the same curriculum committee approval as live face-to-face instruction based courses? _____ yes _____ no

10. What types of Web course software are available to faculty at your college?
____ WebCT ____ Netscape Composer ____ Dreamweaver ____Adobe GoLive
____ FrontPage ____ Blackboard ____ other (please specify: _____)

11. Is there a comprehensive college plan or procedure for faculty who want to teach Web courses at your college? _____ yes _____ no

12. Which types of students are your Web courses primarily designed for?
___ freshman ___ sophomores ___ A.A. degree ___ A.S. degree ___ A.A.S.
___ certificate ___ other (please specify: _____)

13. If your college does not have a plan for developing Web courses what are some of the reasons?_____ lack of financial support _____ lack of technical support staff
_____ lack of faculty interest _____ lack of administrative support
_____ lack of student interest _____ lack of hardware/software equipment
_____ other (please specify: _____)

14. What percent of full-time faculty teach Web courses at your college per year?
_____ less than 10% _____ 10% to 25% _____ more than 25%

15. Is technical support provided to faculty after a Web course is developed?
_____ yes _____ no If yes, what type? _____

16. Is there a budget for developing Web courses at your college? ____ yes ____ no

17. What impact has Web course instruction had on your college?
____ increased college revenue ____ increased operating expense
____ more classroom space ____ faculty satisfaction ____ student satisfaction
____ increased enrollment ____ other (please specify: _____)

18. Instructional design support for Web course development is available to faculty.
___ STONGLY AGREE
___ AGREE
___ UNCERTAIN
___ DISAGREE
___ STRONGLY DISAGREE

19. Does your institution have sufficient hardware to support Web course instruction?
___ yes ___ no

Thank you for completing this survey. A self-addressed, stamped envelop is provided for your convenience in returning this questionnaire to: Glenn Ricci, Dean of Arts and Sciences, Lake Sumter Community College, 9501 Highway 441, Leesburg, FL 34788.

APPENDIX C

STATE LIMITED LIABILITY STATEMENT

If you believe you have been injured during participation in this research project, you may file a claim against the State of Florida by filing a claim with the University of Central Florida's Insurance Coordinator, Purchasing Department, 4000 Central Florida Boulevard, Suite 360, Orlando, FL 32816, (407) 823-2661. University of Central Florida is an agency of the State of Florida and that the university's and the state's liability for personal injury or property damage is extremely limited under Florida law. Accordingly, the university's and the state's ability to compensate you for any personal injury or property damage suffered during this research project is very limited.

Information regarding your rights as a research volunteer may be obtained from:

Chris Grayson
Institutional Review Board (IRB)
University of Central Florida (UCF)
12443 Research Parkway, Suite 207
Orlando, Florida 32826-3252
Telephone: (407) 823-2901

APPENDIX D

COVER LETTER FOR FOLLOW-UP SURVEY

Dear Colleague,

I recently sent you a questionnaire and cover letter regarding Web course development and instruction at your college. If you may have misplaced or discarded that questionnaire and cover letter, I am requesting that you please take just a few minutes to read the cover letter and complete the survey included with this letter. The information you provide is important to Dr. Thomas Kubala, my University of Central Florida doctoral supervisor, others and me in our academic areas and positions. The time required to complete the enclosed survey only takes a few minutes in marking your response to questions.

If you have already completed and mailed the original questionnaire, please disregard this second appeal for your help and cooperation. I look forward to receiving your completed survey.

Thank you for your time. I appreciate your help.

Sincerely,

Glenn Ricci
Dean of Arts and Sciences

APPENDIX E

LETTER OF INTRODUCTION FOR INTERVIEW INSTRUMENT

Dear Colleague,

My name is Glenn Ricci, Dean of Arts and Sciences at Lake Sumter Community College, and I am a doctoral student working under the supervision of Dr. Thomas Kubala, Professor of Higher Education at the University of Central Florida. As part of my research I am interested in conducting an interview to gather information on Web course development, support, and instruction in Florida Community Colleges. I would appreciate your participation in this interview (of 45 minutes or less) because of your efforts in achieving successful Web course instruction and offerings at your college. The schedule of questions is enclosed with this letter. You will not have to answer any question you do not wish to answer. Your interview will be conducted by phone or at your office after I have received a copy of this signed consent from you in the mail. With your permission, I would like to audiotape this interview. Only I will have access to the tape, which I will personally transcribe, removing any identifiers during transcription. The tape will then be erased. Your identity will be kept confidential to the extent provided by law and your identity will not be revealed in the final manuscript.

There are no anticipated risks, compensation or other direct benefits to you as a participant in this interview. You are free to withdraw your consent to participate and may discontinue your participation in the interview at any time without consequence.

If you have any questions about this research, please contact me at (352) 365-3537 or my faculty supervisor, Dr. Thomas Kubala at (407) 823-2007. Questions or concerns about research participant's rights may be directed to the UCFIRB office, University of Central Florida Office of Research, Orlando Tech Center, 12443 Research Parkway, Suite 207, Orlando, FL 32826. The phone number there is (407) 823-2901.

Please sign and return this copy of the letter in the enclosed stamped envelope. A second copy is provided for your records. By signing this letter, you give me permission to report your responses anonymously in the final manuscript to be submitted to my faculty supervisor as part of my course work. Thank you for your kind consideration.

Sincerely,

Glenn Ricci

I have read the procedure described above for the online course interview project.
Participant name (please print) _____
Participant signature _____ Date _____
Name of college where employed _____

Please check one:

____ I agree to voluntarily participate in the interview.

____ I would like to receive a copy of the final "interview" manuscript submitted to the faculty advisor.

____ I would not like to receive a copy of the final "interview" manuscript submitted to the faculty advisor.

APPENDIX F

INTERVIEW INSTRUMENT

Web Course Development, Support, and Instruction

1. Introduction
   Thank you for your time and cooperation in agreeing to be interviewed
   Purpose of the interview
   Request for permission to audiotape the interview (as noted on cover letter)
2. Request for a tour of Web course development and technical support facilities
   What types of hardware and software are used? List
   Number of support staff personnel for Web course development and support?
   To whom is this equipment and facility available?
      Full-time faculty
      Part-time faculty
      Are there any pre-requisites for use?
3. What does Web course curriculum and development support include?
      What department of the college is it administered under?
   Is Web course development instruction available to all faculty members?
   What is the process for providing faculty access to Web course software and hardware? Is this a formal college process or procedure?
   What percentage of your faculty expresses a desire for access to develop Web courses?
4. Under what departmental area of the college should Web course development and instruction be administered?
5. Is Web course development and instruction consistent with mission and vision of the college?
6. What is needed (hardware, software, etc.) to further enhance the Web course development process at your college?
7. What should be included in Web course development support for both faculty and students?
8. How can Web course technology best meet the needs of your students?
9. What are the implications of this instructional technology and access if it is not made available to both faculty and students as related to success?
10. Who is the person ultimately responsible for all Web course instruction that is developed and delivered to students?
11. Which Web course technical support needs are most expressed by students?
12. Does your support system and staff meet those needs?
13. Which academic programs or courses are taking a lead role in Web course development and delivery?
14. What is the total number of faculty here who teach either fully online, partially online, or media enhanced courses?
15. Which academic departments are involved with the total process of Web course development?

16. What is the culture of the college regarding Web course development and delivery?
17. What forms of Web course support are available to students?
18. What forms of Web course support are available to faculty?
19. What is the current status of Web course development?
20. Is there any reluctance of your college to offer Web courses?
21. If so, why?
22. How has Web course development and delivery of instruction occurred at your college?
23. How did your college prepare for developing and offering Web courses?
24. What is the history of Web course development and offering at this college?

THANK YOU FOR YOUR TIME AND INFORMATION.

APPENDIX G

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